

MAXIMUM POWER GAMING

atomic

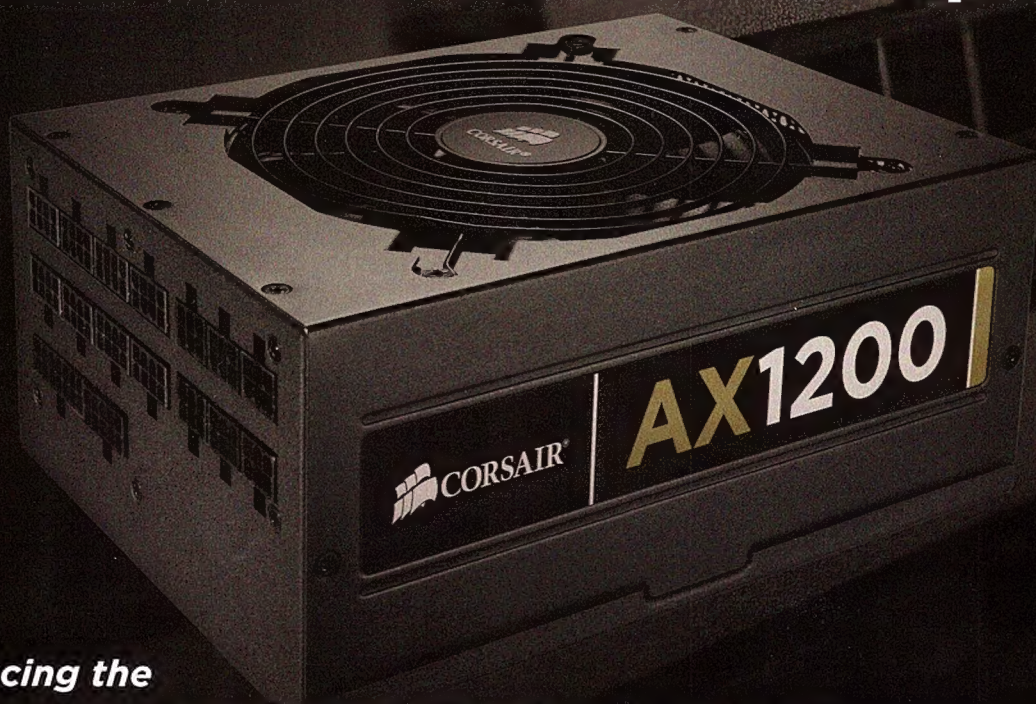


• E3 REPORT • MOTHERBOARD ROUNDUP • 990FX •
• STARCRAFT II: WINGS OF LIBERTY • COMPUTEX 2011 •

AX

CORSAIR®

Absolute Power. Uncorrupted.



Introducing the
Corsair Professional Series™ Gold Power Supply
Brilliantly designed to deliver up to 1200 watts of clean, stable power



The Corsair Professional Series Gold PSU family. Designed for you. Learn more at corsair.com



CHASSIS



MEMORY



POWER SUPPLIES



SSDs



USB DRIVES

ALTECH
COMPUTERS
WWW.ALTECH.COM.AU

We've designed a complete line of enthusiast-grade components
and accessories to make your next PC your best PC.

NSW

ARC Computers 02 9748 8322 arc.com.au
Aus PC Market 02 9646 8000 auspcmarket.com.au
LJK International 02 9745 0877 ljk.com.au
Megaware Computers 02 9698 1593 megaware.com.au
MWAVE 1300 727 446 mwave.com.au
Techbuy 02 9648 1818 techbuy.com.au
ACT
Principal Computers 02 6223 2477 principalcomputers.com.au
NT
Palmerston Computers 08 89325 366 palmerstoncomputers.com.au

QLD

Computer Alliance 07 3420 3200 computeralliance.com.au
Game Dude 07 3387 1500 gamedude.com.au
IT & Support Direct 07 3369 3928 itsdirect.com.au
Umart Online 07 3369 3928 umart.com.au

WA

Austin Computers 08 9201 2788 austin.net.au
Netplus Computer 08-92427288 netplus.com.au
PLE Computers 08 9309 4771 ple.com.au

VIC

CentreCom 1300 007 600 centrecor.com.au
Computers & Parts Land 03 8542 8688 cpl.net.au
PC Case Gear 03 9551 0889 pccasegear.com
Scorpion Technology 1300 726 770 scorptec.com.au

TAS

Taspro Computers 03 6424 1911 taspro.com.au
Principal Computers 03 6235 5010 tasmanianpc.com.au

SA

Allneeds Computers 08 8211 8861 allneeds.com.au
Getright Computers 08 8231 0622 getright.com.au
MATS Systems 08 8186 2110 mats-systems.com.au

AUCKLAND

Computer Lounge 09 368 4818 computerlounge.co.nz
DTC 09 623 4988 dtconline.co.nz
Playtech 09 415 1020 playtech.co.nz

ED HEAD

Failure is hard

How hard, you might wonder? Well, it takes dedication to fail at a certain level. Much like it takes years of training to compete in sports at an Olympic level, it follows that it must take serious effort to so seriously fail as much as Duke Nukem Forever has.

You can read our full review later this issue, but even though that was written a few weeks ago (longer, really, given I'm writing this column two weeks before the

magazine is even on sale), we're still amazed at what a bad idea the game is.

Think about it for a moment. More than ten years of development, across multiple developers. It's likely that hundreds of people have had a hand in the game, if not more. Thousands of hours of testing and playing must have taken place.

When you think of all the chances there could have been for someone to say "Wait a minute, this game sucks harder than a sucking thing," you realise the effort it must have taken to ignore the bleeding obvious.

Well, it's that, or we simply assume that Randy Pitchford is certifiably insane and can no longer tell a good game from a bad one. You know, the same affliction that mysteriously befell Jon Romero right about the time of Jon Romero's Daikatana...

David Hollingworth
dhollingworth@atomicmpc.com.au
Twitter: @AtomicMPC
Facebook: AtomicMPC



atomicCREW

editorial
editorial@atomicmpc.com.au
editor david hollingworth
deputy editor justin robinson
editorial assistant ewa grygier

design
art director david west
product photography jason busch
creative director sam grimmer

contributors: dan rutter, ashton mills,
chris taylor, jake carrol, ben mansill,
vito cassis, dave jansen, john gillooly

production
group production manager angela sutherland
production manager ewa grygier
printed by webstar

distributed by
network distribution company
(02) 9282 8777
gordon & gotch new zealand
(09) 625 3005

advertising + marketing
t+61 2 8399 3611 f+61 2 8399 3622
group advertising manager joanne nichols
jnichols@haymarketmedia.com.au

haymarket media
t+61 2 8399 3611 f+61 2 8399 3622
50 victoria street, mc mahons point
nsw 2060

managing director jeremy vaughan
commercial director darren mc nally
publishing manager phil vella

Atomic: Maximum Power Computing is published monthly by Haymarket Media. Company registered in Australia (ABN 61 083 063 914). This publication may not be reproduced or transmitted in any form or by any means, without the written permission of the publisher.
Liability: While every care has been taken in the preparation of this magazine, the publisher cannot be held responsible for the accuracy of the information herein, or any consequence arising from it. Please note that all review judgements have been made in the context of equipment available to Atomic at time of review.
Editorial and product submission: Atomic welcomes all information on new and upgraded products and services for possible editorial coverage. However, we respectfully point out that the magazine is not obliged to either review or return unsolicited products. Products not picked up within six months of submission will be used or donated to charity. The Editor welcomes ideas for articles, preferably sent in outline form, with details of the author's background and a few samples of previously published work. We cannot accept responsibility for unsolicited copy and stress that it may take some time for a reply relating to these submissions to be sent out. Editorial items in Atomic originally published by Dennis Publishing remain the copyright of Dennis Publishing.



Please recycle this magazine



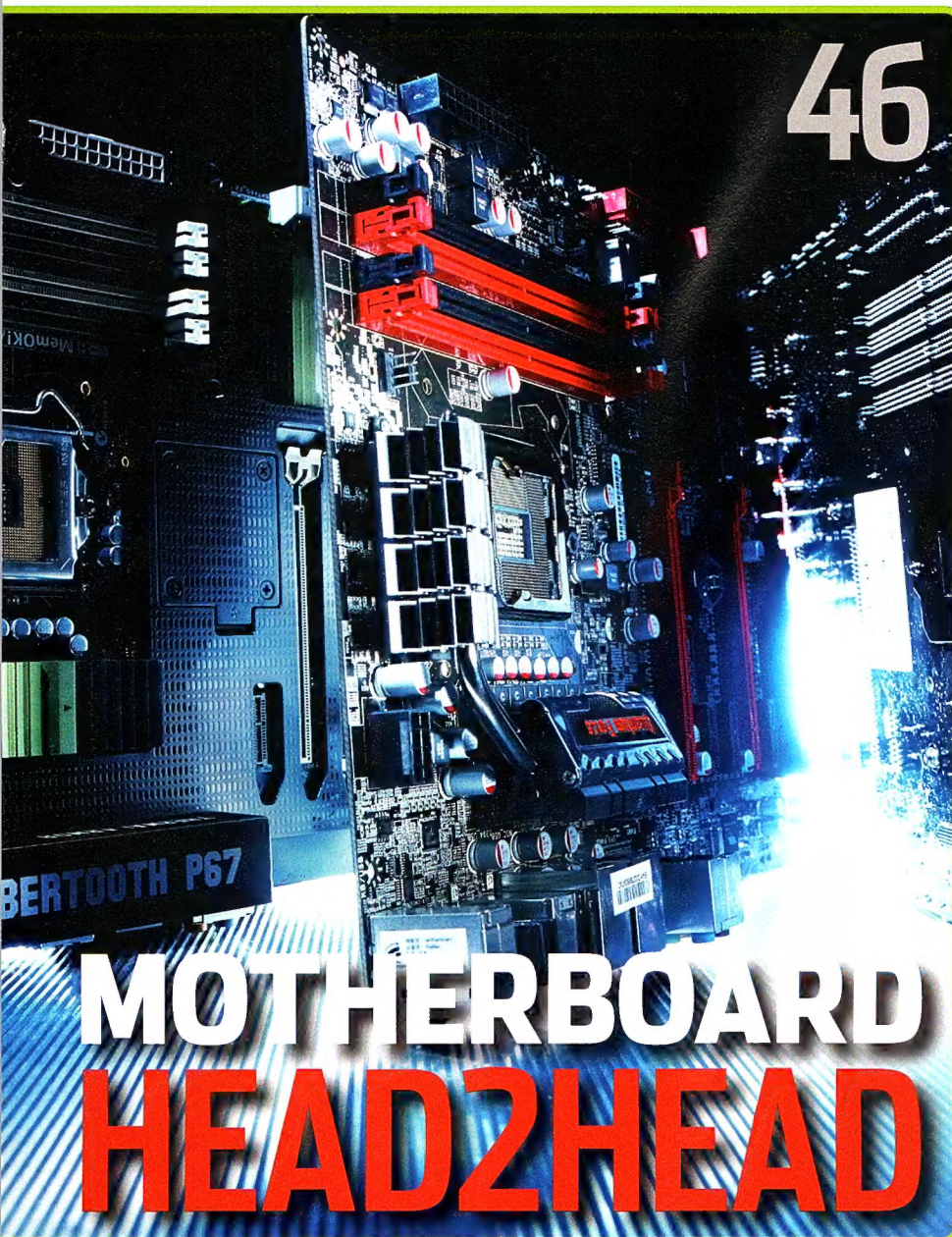
Printed on paper sustainably sourced from PEFC certified forests

127

ISSUE



ISSUE 127



46

LOGIN

Mod News

Mod madness with Ashton.

Gearbox

All the best new stuff.

X-Ray

Jake Carrol on that oft-neglected bit of kit: the brain.

I/O

Our monthly helpdesk.

Open GL: Closed?

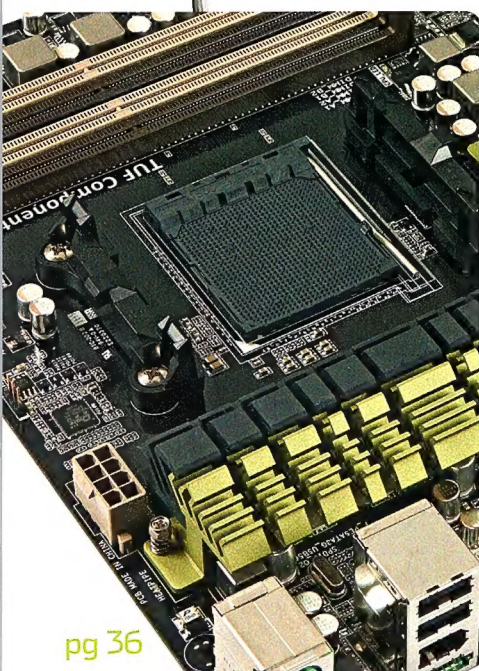
Will this humble graphics API survive the Direct3D onslaught?

pg43



SUBSCRIBE & WIN pg 66

August



pg 36

HARDWARE 31

SPECIAL REPORT

Computex 2011 32

MOTHERBOARDS

ASUS Sabretooth 990FX 36

GIGABYTE 990FX 38

MSI Z68 39

PERIPHERALS

Razer Onza Tournament Edition 41

GIGABYTE Aivia gaming mouse 41

Razer Chimaera headset 42

GT2 Wheel/Pedals 42

CASES

Corsair 600T 43

NOTEBOOKS

MSI GT680-055AU 45

HEAD 2 HEAD

P67 Motherboards 46

Kitlog 60

TUTORIALS 69

ATOMIC.EDU

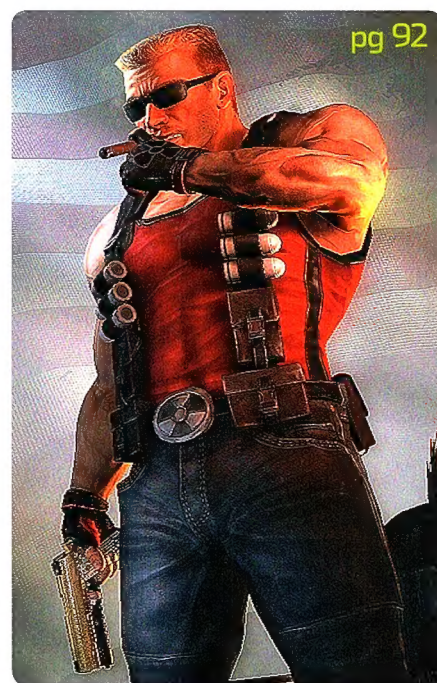
Chris Taylor explains the process of becoming a cop. 70

HOW TO...

We show you how to use a soldering iron without injury. 72



pg 45



pg 92

GAMEPLAY 75

SPECIAL REPORT 76
E3 best in show

ENGINE ROOM 82
We chat to Blizzard about Starcraft II's upcoming expansion.

Cities in Motion 86

DiRT 3 88

Hunted: The Demon's Forge 90

Infamous 2 91

Duke Nukem Forever 92

Dungeon Siege III 94

PCDIY

The best price in town

www.pcdiy.com.au

CHOICE OF PROFESSIONALS

New

Australia debut

msi GT780



Features:

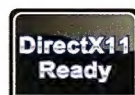
- Steel Series full color backlit gaming keyboard
- Dynaudio speakers with THX TruStudio Pro™
- Exclusive MSI Turbo Drive Engine (TDE) Technology
- Powerful DirectX11 Graphics Card



The most often used keys in gaming, A, W, S, W, Ctrl, and Space bar, are ergonomically arranged in a "Golden Triangle" layout.

Colour
OS
Screen
Processor
Graphics
Memory
Storage
Network
Wireless LAN
Optical Drive
Speakers
Audio
Card reader

Brushed Metal Black
Genuine Windows® 7 Professional
17.3" Full-HD (Non-Glare, 1920x1080)
Intel® Core™ i7 - 2630QM
NVIDIA® GeForce® GTX560M 1.5G DDR5
8 GB DDR3
750GB (7200RPM)
10/100/1000 Mbps
802.11 b/g/n WiFi
Blu-ray
2 speakers / 1 subwoofer
7.1 with THX TruStudio Pro™
4-in-1



DirectX11 Ready



Sound by Dynaudio



TruStudio PRO



Windows 7



Full-Color Backlight Keyboard



Exclusive TDE Technology



Turbo Battery +



2 Years Warranty
<http://www.msi.com>

msi GT683

Colour
OS
Screen
Processor
Graphics
Memory
Storage
Network
Wireless LAN
Optical Drive
Speakers
Audio
Card reader

Black Film Print Design with LED Illumination
Genuine Windows® 7 Professional
15.6" Full-HD (1920x1080)
Intel® Core™ i7 - 2630QM
NVIDIA® GeForce® GTX560M 1.5G DDR5
8 GB DDR3
750GB (7200RPM)
10/100/1000 Mbps
802.11 b/g/n WiFi
Blu-ray
2 speakers / 1 subwoofer
7.1 with THX TruStudio Pro™
4-in-1



Features:

- Exclusive Cooler Boost Technology
- Dynaudio speakers with THX TruStudio Pro™
- Exclusive MSI Turbo Drive Engine (TDE) Technology
- Exclusive LED Performance Illumination Technology

The best price in town

* VIC-BOX HILL

2 Cambridge Street. VIC 3128

Tel: 03 9077-9811 Fax: 03 9077-9812

Email: Boxhill@pcdiy.com.au

Mon to Fri: 10:00am-6:30pm Sat: 10:00am-5:00pm Sun: 12:00pm-4:00pm

* NSW-AUBURN

Unit 20, 191 Parramatta Rd

Tel: 02 9648-1001 Fax: 02 9648-3003

Email: Auburn@pcdiy.com.au

Mon to Fri: 10:00am-6:30pm Sat to Sun: 10:30am-4:00pm

* SA-ADELAIDE

132 Franklin Street (Enter from Morphett St)

Tel: 08 8410-0446 Fax: 08 8212-7092

Email: Adelaide@pcdiy.com.au

Mon to Fri: 10:00am-6:30pm Sat: 10:00am-5:00pm Sun: Close

* Specifications & features accurate at time of printing * For pricing & availability please contact your nearest PCDIY Branch.



Kinect beta SDK released 'pon the nerdy masses

Naturally the first thing that follows is lightsabers...

Microsoft's Kinect sparked the imagination of geeks everywhere when it was released, but the lack of an official driver and interface restricted its use to those smart few who could crack and hack it into some semblance of working order.

Luckily for everyone else, Microsoft has just released the beta Kinect SDK, or Software Development Kit, meaning everyone with a cool concept and average programming skills will be able to plug their Kinect into their PC and let their creative juices flow.

Microsoft have given the Kinect community a helping hand by releasing instructional videos, or 'Quickstarts', on everything from using depth data to tracking a skeleton; even plugging in the sensor gets its own helpful video (<http://channel9.msdn.com/series/KinectSDKQuickstarts/>).

As boasted in a press release, "The SDK code is designed to encourage academic researchers, developers and

enthusiasts to create new experiences for natural user interface technology beyond gaming and entertainment, such as healthcare, education and science. The new experiences can include depth sensing, human motion tracking, and voice and object recognition using Kinect technology."

Also noteworthy is that the beta Kinect SDK is for non-commercial uses only, and that "Microsoft intends to release a commercial version of the SDK at a later date; details will be released when they are available."

The SDK is available to download at a specially-crafted microsite (<http://research.microsoft.com/en-us/um/redmond/projects/kinectsdk/>), with the lightsaber project available to view here: <http://channel9.msdn.com/coding4fun/kinect/Of-course-our-first-Kinect-for-Windows-SDK-Project-has-to-involve-a-Light-Saber>. If you're an enterprising Atomican and create something cool with the SDK, let us know on the Forums or via email!

Just keep it G-rated!

Intel Knight's Corner challenges NVIDIA supercomputing stranglehold

Big Blue vs. Green Giant in a fight for science's most coveted exascale workloads.

While they've had plenty of success in the traditional CPU market, Intel have been eyeing off a market segment that until recently has remained relatively untouched by the big blue: highly-parallel smaller-scale supercomputing.

Announced on June 20, 2010 were plans to reincarnate the unsuccessful GPU project Larrabee as a reinvigorated supercomputing platform, known as Knight's Corner.

Exactly a year later came an announcement that first-generation Knight's Corner product, Aubrey Isle, will finally be put into production.

Intel Vice President Kirk Skaugen highlighted the company's plan for Knight's Corner: "While Intel Xeon processors are the clear architecture of choice for the current TOP500 list of supercomputers, Intel is further expanding

its focus with our Many Integrated Core architecture for petascale and future exascale workloads."

This announcement has implications for the M2090, NVIDIA's Tesla product, a somewhat similar supercomputing platform that instead of using traditional x86 cores, uses 512 graphics processing cores. This platform is highly specialised and code must be ported to the CUDA language; but the performance is certainly attractive.

Performance of Knight's Corner was not announced, though we speculate it will be mostly useful for largely-threaded workloads. Either way, Knight's Corner will form part of the next decade's scientific advances - whether NVIDIA likes it or not.



Well, we've shuffled around to that time of the month again. When we pull up a spot around the fire, and talk about the best tales told in our little neck of the woods.

It's Post of the Month time!

And this month we have a classic bit of Atomic tech to reward, one that caught the eye of quite a few travelers as they passed on their way. Who is our journeyman, then, who walks away with a shiny new BlackWidow keyboard?

philo-sofa! His excellent HD 6990 review is a great piece of work. Well done that man! <http://forums.atomicmpc.com.au/index.php?showtopic=42857&st=0&p=860948&entry860948>

As usual, no post is an island for PotM, and philo's joined by three other stalwart companions:

jonna4130 took us through his neat racing simulator build. <http://forums.atomicmpc.com.au/index.php?showtopic=42929>

seehund got all hypothetical and talked us through the Rapture. <http://forums.atomicmpc.com.au/index.php?showtopic=42815&st=0&p=860153&entry860153>

And **tantryl** got us thinking about great stories in games. <http://forums.atomicmpc.com.au/index.php?showtopic=42858>

Thanks a mess folks - see you out there on the open forum road!



MODIFICATION

With Ashton "Two mods are better than one" Mills.

Witcher 2 HUD and panel tweaks

Game Witcher 2

URL witchernexus.com/downloads/file.php?id=132,
witchernexus.com/downloads/file.php?id=87

It's Witcher 2. Geralt wants mods. And what Geralt wants, he usually gets.

Even sans an official construction kit, modders have had at Witcher 2 like the Drowned to your leg dipping in the wrong pool. Three weeks after release there were "counts"... 85 mods. It helps that the packaging format was reversed engineered in a few days. And so with or without the blessing of CD Projekt RED, we have a wide selection.

It's hard to choose the highlights at this stage – and there are your host of texture replacements (more battle scarred Geralt, sexier Triss etc.) – but we'll start with the basics: two mods, by the same author, FollowTheGourd. They both focus in improving the interface, which is essential for any game.

The HUD tweaks aim to improve the interface through smart, simple tweaks. These include a smaller target lock-on icon, which sometimes annoyingly obscures enemies; adding a small crosshair to show Geralt's aim in combat but which disappears out of combat as with Witcher 1; a minimap direction pointer for true north to help with navigation; and to top it all off when you open the quick menu you no longer need to both select and click the icon, instead just hovering above the selection and letting the menu close will activate it.

The panel tweaks pair excellently with HUD tweaks and adds sorting options and filters



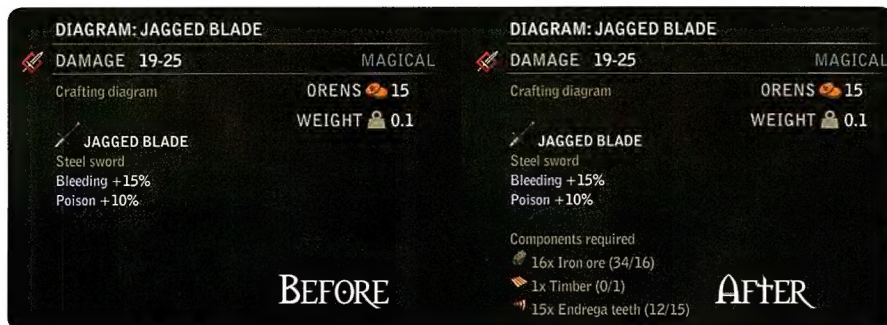
Both are simple but brilliant tweaks that won't change your game but will enhance the experience of it. If you're running around in Geralt's shoes, grab them.

for misc items; improved default ingredient selection for alchemy (using cheaper and more abundant ingredients in your inventory if possible), and it won't forget your last selection; helpful ticks next to books, formulas and crafting diagrams when shopping so you know what you already have; and much desired expanded tooltip boxes – almost double in size so you don't have to scroll so much.

Both are simple but brilliant tweaks that won't change your game but will enhance the experience of it. If you're running around in Geralt's shoes, grab them.

Two others that deserve mentioning but don't bear an

extensive description (because they do what they say on the tin) are the Australian Un-Edit patch (www.gog.com/en/forum/the_witcher_2/australian_users_click_here_un_edit_patch) and Block without Vigor drain (witchernexus.com/downloads/file.php?id=11). If you've been playing, you know why you might need them.



Dark Mod

Game Doom III

URL www.thedarkmod.com



Thief was a gem among the hallowed halls of gaming. Some still lament that there's been no equivalent since, while others try to mod more modern engines in the vein of the world's first, best, FPS (that's first-person *sneaker*).

One such mod is Dark Mod, an amazingly extensive mod for the best, darkest, most brooding engine there is – DOOM III. What better match for a Thief inspired game?

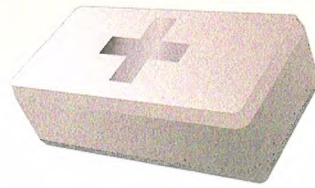
Dark Mod, while technically a mod, is actually a total conversion and provides a framework to build Thief-style environments and missions using the DOOM III engine. It revamps AI, graphics, the HUD and weapons to bring that gothic steampunk feel of Thief to

life. It even comes with its own mission-building editor, and that's key because Dark Mod itself only provides one mission, the training mission. To enjoy more escapades in the universe, you need to download missions separately – and there are loads to choose from. If there's a failing with Dark Mod's it's that there's no 'campaign' as such, just lots of separate missions you can download and play. However, the most recent 1.06 release as of June this year adds support for linking missions into campaigns so this may soon change.

Dark Mod alone weighs in at a hefty 2GB or so, to give you an idea of how much work has gone into this. Missions can vary in size, and



PATCH notes



The Witcher 2: Assassins of Kings Patch v1.1

Starcraft 2: Wings of Liberty Patch v1.3.4

EVE Online: Incursion Patch v1.6

Company of Heroes: Tales of Valor Patch v2.6.0.1 to v2.6.0.2

Blood Bowl Patch v1.2.0.1

World of Tanks Patch v0.6.3.11 to v0.6.4

Assassin's Creed: Brotherhood v1.02

can all be found at the Dark Mod site as well as being installable in-game from the Dark Mod servers.

And as DOOM III is one of those few games that also came with native Linux binaries, you can also play Dark Mod and its missions under Linux too.

If you miss Thief, and would love to see a respectful homage rendered in a more modern engine, dust off your copy of DOOM III and return to the thrill of sneaking in the shadows, firing off water arrows to knock out lights, blackjacking those pesky guards, and making off with the prize... 



GEARBOX

All the coolest gadgets & gear.



Logitech Tablet Keyboard for Android

Price: TBC Website: www.logitech.com

To some (okay, most) normal folk, Android tablets are the forgotten stepchildren of the attention-hogging iPad. They have red hair and those freaky eyebrows you can't really see, and there's a sense that they're a little bit too creepy for the common people.

Well, in our humble opinion, it's time for them to come out of the wilderness and in from the cold. iPads may be shiny and fancy and all, but Android is the way of the future. And some manufacturers are finally wising up and making accessories for them, like this neat little keyboard and case combo that also acts as a tablet stand. It's sleek and sexy and finished in hints of blue. Of course, if you're worried about what other people might think, just get them to squint – that could easily be an iPad being propped up there.

TEAC SBOT4 Sound Bar

Price: \$99.95 Website: www.teac.com.au

A true surround sound home theatre experience is one of those things that is awesome in theory. In practice, it usually costs lots of money, takes up bits of space that we don't all have, involves arranging ones lounge room in one way and one way only, and lots and lots of cables.

Enter the Teac Sound Bar. Now, before you get too excited, it's not exactly surround sound – 2.1 channel instead of your usual 5.1 or 7.1 affairs – and it's by Teac, who are famous for being 'cheap and cheerful' and loved almost exclusively by poor students in sharehouses who buy their electronic equipment at Kmart, so it's not exactly going to replace that four-figure set-up you might have your eye on. But still: it's cheap, takes up very little space, doesn't ask you to move your couch and won't cause you to trip over any cabling. You could probably do worse...



Corsair Link Cooling and Lighting Kit

Price: US\$130 Website: www.corsair.com

Sometimes we get bits of hardware on our desks that look so cool we don't even care what they do. Who cares that it's a router cleaner, we ask; it has racing stripes! It's awesome!

And sometimes the opposite happens, like with this little bit of kit from Corsair. It looks all boring and, well, like cabling and adapters. But all those boring pieces come together to create a complete lighting and cooling control centre for that box you've got that's just crying out to be pimped. The Link gives you control over up to five fans, with three temperature sensors, as well as up to 33 LED strips across two channels, with colour controls that let you pick any one of several million colours. It's also compatible with Corsair's fancy Hydra series liquid CPU coolers.

*Because style ain't everything, obviously.





BitFenix USB 3.0 Front Panel

Price: \$24.95 Website: www.bitfenix.com

We've made no secret of the fact that while BitFenix is a relatively new name around these parts, it's already one we are quite fond of. Their Shinboi case even earned itself a Hot Award, which, as you all know, is quite the accolade. Hardware folks will do just about anything for one of those little red megaphones – there are even reports of cage fighting – and BitFenix just strolled off the street and took one on their first go round.

This is not to say you need one of these little USB 3.0 adapters, but if you are finding yourself increasingly surrounded by USB 3.0 gadgets while still living in a USB 2.0 world, and you've got a spare drive bay in your gaming box, this might be a nifty solution to your problem. And cheap too – like that sweet, sweet case.



TomTom High Speed Multi-Charger

Price: \$39.99 Website: www.tomtom.com

It may not be sexy or exciting, but dammit, to a person who lugs around a fair amount of tech every day, and who is notoriously bad at remembering to plug said tech in to charge of an evening, a good multi-purpose charger has a hell of a lot of appeal.

This little TomTom is your car version, so not particularly useful to us non-drivers out there, but it does promise to charge up to three of your favourite gadgets up to four times as fast as other chargers. The claim is that unlike most devices, the TomTom gives each of its outlets full-power all the time, so there's no sharing like there is on your bog standard multi-purpose charger. It's selfish and sets a terrible example for any kids out there, but dammit, as soon as we learn to drive, we'll be taking one in every colour.



Buffalo MiniStation USB 3.0 Portable Hard Drive

Price: \$99 (500GB) \$139 (1TB) Website: www.buffalotech.com

The rugged portable hard drive is a fantastic thing. You can chuck it around to your hearts content secure in the knowledge that your precious data is all wrapped up under layers and layers of rubber, shock-absorbent padding and plenty of 'toughening stuff' (that's a technical term), safe from harm.

But therein lies the rub. Rugged tech usually looks, well, rugged. Rubbery. Big. Toy-like. Chewy, almost.

And that's where the Buffalo MiniStation comes in. It may be rugged, with its plate spring and silicon shock dampeners, but it doesn't look it. In fact, it looks rather delicate and sleek and shiny and grown up. As grown-up things like hard drives should.



Insane in the brain

Jake Carroll is making you read this – with his MIND.

Once science fiction, the idea of controlling computers, vehicles and the environment around us with our minds is fast on its way to becoming science fact. That said, if we take guys like Magneto and Professor Charles Francis Xavier out of the equation, not many of us have the ability to really interact with objects (inanimate or otherwise) with only the power of our thoughts.

This month, we're going to get involved with a group of technologies and people who thought it was time we cross that human-mutant bridge and create some incredibly innovative assistive technologies that let us begin to approach the controlling of the world around us with our thoughts.

Neuroscience 101

Just as a precursor, we're going to paint in some fairly broad brush strokes here, with some large simplifications being made to prevent X-Ray turning into a 7000 page biology tome this month.

The brain is the centre of our nervous system. The cerebrum, what most people think of as the brain, is made up of four main sections: the frontal, parietal, occipital and temporal lobes. Each of these parts is generally understood to be responsible for separate aspects of our being. It's suggested that our frontal lobes are responsible for the majority of executive function

that takes place in our day-to-day lives. These functions involve reasoning, logic, self-control and planning, as well as abstract thought. The occipital lobe is widely understood to be responsible for our vision and processing of images. It's the ultimate GPU.

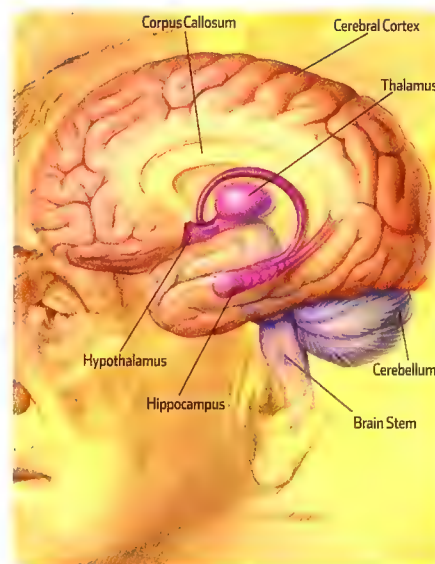
Our brain is like an impressive super computer, really. It monitors and regulates the body's actions and reactions in real time through feedback channels and mechanisms. It's continuously receiving sensory information from all of the sensory networks around the body, in a similar sense to the way SCADA (Supervisor Control and Data Acquisition) networks function in big mining, process and engineering plants. Once our brain gathers enough data, it then responds accordingly to control bodily function.

The part of our brain responsible for the most basic aspects of sustaining human life (breathing and heart function) is the brain stem. Interestingly, it's completely autonomous of other conscious brain functions. The neocortex is responsible for higher order thinking, learning and memory. The cerebellum is responsible for our motor-capabilities, balance, posture and coordination of movement.

OCed too hard. Melted

As humans, we wear out, break down, are disease ridden and rarely turn out as perfect physical specimens. This is one place where

your Core i7 CPU has it over you. It generally won't make too many mistakes (unless you LN2 cool it, and you end up with the magical cold bug) with age. Humans don't have that quality. With age, disease and mistreatment, things start to go wrong. Despite having a thick armour around it (the thick bones of the skull), being



An internal drawing of the human brain, showing major non-exposed components.

suspended in cerebrospinal fluid and having a blood brain barrier, we're still susceptible to all kinds of diseases and damage. Whether it is physical damage from a sharp knock to the head, a stroke, neurotoxic poisoning, Alzheimer's disease or schizophrenia, we're very much in trouble if our brain starts to fail us.

The kicker in all of this is that psychological and physiological disorders of the brain are not well understood. Chemical imbalances, physical abnormalities or otherwise all play a factor in our outcomes as functional (or non functional) human beings, but the exact causes and why our brain (and then, as an extension, mind and intellect) does what it does aren't scientifically

Assistive technologies

We're going to change track for a bit. About nine years back, Microsoft came up with the idea that students of all different disciplines can and will one day change the world somehow. MS felt that making a competition out of this would draw young people (who they might some day hire) and their imaginations to the forefront of development and engineering and perhaps one day make humanity a whole lot nicer for us all. It became known as the Imagine Cup.

Conveniently for this particular instalment of X-Ray, Australia has some very talented young people involved in the Imagine Cup 2011. So

They looked at statistics regarding disability in Australia and saw a defined need for assistive technologies in this space. There are a lot of people in our country who need help. One of the team (Le) is doing research into brain/computer interfaces, so it made sense for the group to see how they might apply such technologies into helping people who face problems with communication, interaction and mobility.

The key motivation behind Brain Speller is to provide a way for people with significant physical and mental impairment (whether they be causalities of each other, or separate issues) to communicate, resulting in increased productivity. The bigger picture is, of course, giving people back their independence and the freedom to do things for themselves.

...the exact causes and why our brain (and mind and intellect) does what it does aren't scientifically that well understood yet.

that well understood yet.

Whilst we don't yet have the ability to spot or treat every problem with the human brain, there are plenty of ways we can use innovative technologies to mask some of the problems and give people who suffer from mental or brain related illnesses a better quality of life.

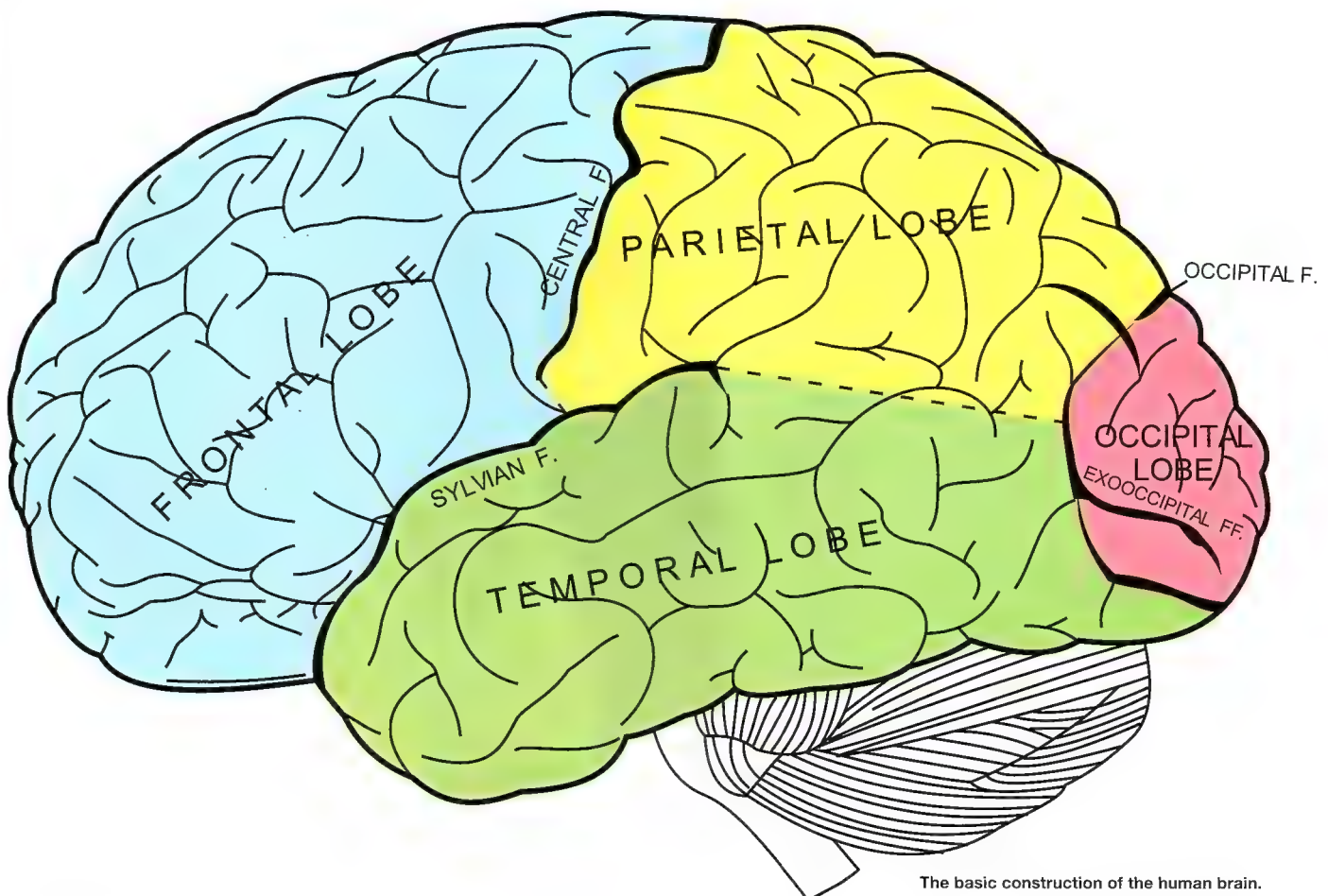
talented, that they've won their way across to New York City in July for the world wide finals. We are of course referring to the UCEEG team from the University of Canberra and their entry, known as Brain Speller.

The team have altruistic and community-minded intentions for the Brain Speller project.

So, it's Matrix/Neo style 'plug in and learn', right?

The way Brain Speller works is through a set of technologies and frameworks that come together to form a fairly unique product. The solution uses an SDK from Emotiv Systems and the EPOC developer Neuroheadset.

The headset measures electrical signals from the user's brain, which are then mapped to actions in the UCEEG program that the team has written. The solution then allows users to



The basic construction of the human brain.



The Emotiv Systems -designed EPOC Neuroheadset.



An EEG spike that represents the onset and subsequent event of an epileptic episode.

type letters by 'thought' on an interface to spell words and then allows the computer interface to translate this into speech through a set of computer speakers.

Exactly how these electrical signals could be translated from being simply that, electrical signals, into meaningful letters and numbers rather than just primitive movements involves some more complex theory. The technology, known as electroencephalography, or EEG, is key to all of this.

EEG

Just like computers and CPUs, our bodies have electrons buzzing around in them. Hard as it is to comprehend, we are electrically active beings. Sure, Raiden-like powers and harnessing lightning might be a bridge too far, but we do have billions of neurons firing off in our brain, and that's what maintains the electrical charge. Neurons are electrically charged (or polarised/ given polarity) by membrane transport proteins that push ions across their surfaces. Ions of like charge repel. Ions of differing charge attract. It's these action potentials, and the waves of attraction and repulsion that create forces that can be measured in our scalp (by way of a metal electrode, for example). Recording the voltages that result from these behaviours gives us EEG.

Scalp EEG (very commonly used in research and diagnosis) activity shows us oscillations at a variety of frequencies. Different frequencies are characteristic of different types of brain states and function. This is one of the ways companies like Emotiv and groups like the University of Canberra's EEG team (UCEEG) have been able to determine actions based upon thoughts, in a trivial (and not so trivial) manner.

EEG is very useful in clinical and research settings. In the research sector, EEG is

used extensively in neuroscience, cognitive neuroscience and cognitive psychology. All this being said, many of the techniques used in EEG for research are highly experimental, and not standardised or approved for use in clinical work (yet.)

Higher end EEG systems such as the BioSemi EEG allow for 128 simultaneous channels of measurement. This is often paired with fMRI hardware (Functional Magnetic Resonance Imaging) to measure haemodynamic response to neural activity. Put simply, as a brain

is stimulated by something external, blood flow around it can be observed.

To put it into context, consumer and developer grade systems (such as the Emotiv EPOC) used in the UCEEG trials have 14 sensors to measure data from the scalp.

In capturing all this data, groups such as UCEEG and the engineers that created technologies such as Emotiv's EPOC, and other systems like it, have been able to correlate many of the action potentials, patterns and spindles with real world requests/requirements and wants of a user. To that end, the UCEEG team have created a mobility solution, for those physically impaired or with mobility difficulties. They have connected the remote control of a remote control car to a computer and controlled the car using the EPOC headset along with their Brain Speller platform.



An EEG cap, with visual stimuli being projected for a user. The idea here being that a user is stimulated in some way visually, which is passed on to the brain, which then in turn has some form of action or reaction that can be measured by an EEG input device.



I Rule My Game!

ROG MATRIX GTX 580 Graphics Cards

TweakIt

Instant voltage adjustment!



ProbeIt

Instant voltage measurement!

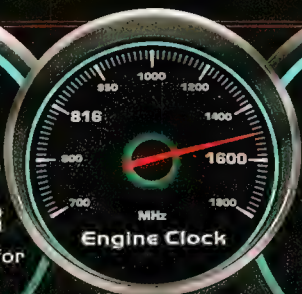


Safe Mode Button

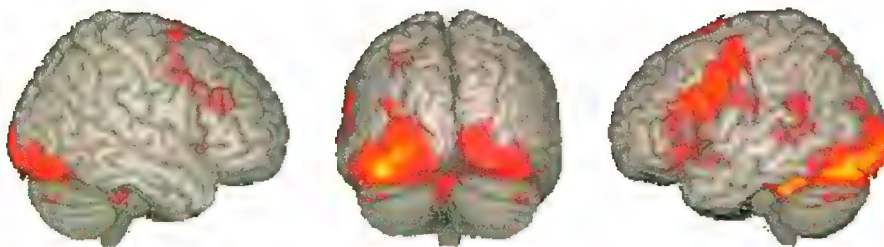
Instant settings reset!



Graphics Engine: NVIDIA® GeForce® GTX580
 CUDA Core: 512/Engine Clock: 816MHz
 Memory: 1536MB GDDR5
 Memory Clock: 4008MHz (1002MHz GDDR5)
 Memory Interface: 384 bit



ASUS
 Inspiring Innovation • Persistent Perfection



fMRI showing 'hot spots' of activity where blood flow has concentrated given specific or targeted stimulation.

The implications of this are obvious and far-reaching. Imagine being able to 'think' your way around corners; to pilot a car, a boat or a vehicle that you otherwise couldn't operate safely on the basis of quadriplegia or other physical impairments. Imagine being able to power a set of prosthetic legs attached to amputated limbs – by thought alone. It's as if you'd be simply moving an extension of yourself, as we do with real flesh and bone.

One of the biggest hurdles to overcome in this realm of applications was usability. The UCEEG team was careful to implement its own modified version of the T9 predictive text algorithm as a basis for the interface. They also modified the SDK provided by Emotiv to enhance the

very early days and that the current developer/consumer EEG hardware produces fairly noisy signals, and, as such, might not be ready in mission critical environments just yet.

Interestingly, there are other groups around the world doing similar things. BrainDriver, by Autonomos-Labs (<http://autonomos-labs.com>) aimed to drive a car with similar EEG based sensor techniques, using the same Emotiv EPOC platform.

The long view

We don't know how fast EEG is going to change the world, or if, in the near future, it will make the lives of millions much more comfortable. What we do understand however, is that groups

Imagine being able to 'think' your way around corners; to pilot a car, a boat or a vehicle that you otherwise couldn't operate safely...

evaluation of the signals for different events such as facial expressions. Some allowances for filtering certain channels in EEG capture for different eye movements can also be made by the user.

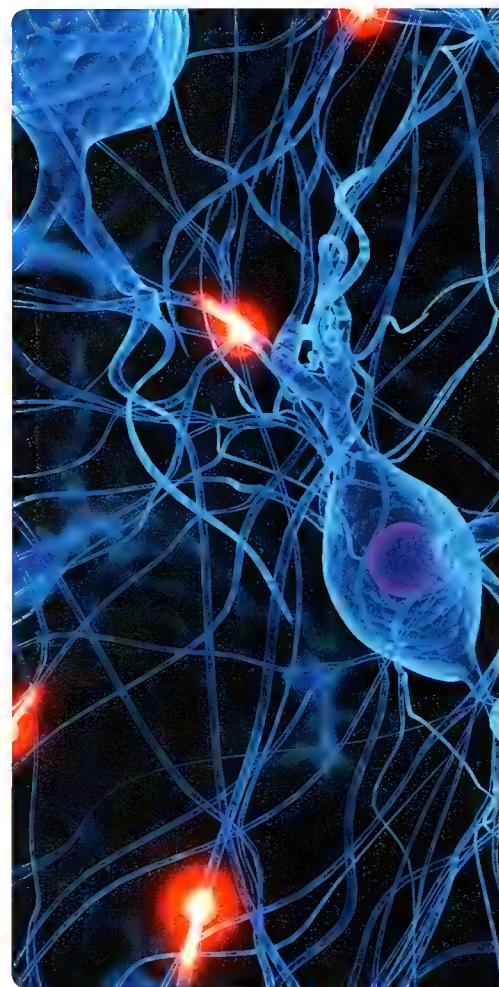
AI or not AI?

In systems such as these, there is often an assumption that some form of artificial intelligence is being used or implemented. We asked the UCEEG team if this was a 'learning' system, or if it was built upon dictionaries of terms, actions, signal patterns and predefined responses. Through investigation, we've learnt that the system is not an on-the-fly environment as actions are predefined, so it cannot learn as the user is interacting with it in real time. This is perhaps (currently at least!) expecting a bit too much from the technology.

Limitations and pushing the boundaries

We were quite interested in just how far the current technology the UCEEG team had worked with and implemented on top of could be pushed, so we asked them. One of our suggestions was the remote control of large systems, hazardous environments or industrial manufacturing/SCADA where human presence isn't safe. The team suggested to us that it's

such as the UCEEG and Autonomos-labs are pioneers of 'what might be' in the near future. As an unqualified observation, it seems that the biggest difficulty that we face in the uptake of this technology in real world applications is the latency of communication; the difficulty of translation of commands into real world primitive user actions and the inability to construct logical actions that can be autonomously interpreted by computers in real time. The number, variability



and complexity of the signals that are pouring from our brains are still far too much for a humble human-designed CPUs to deal with, given current software engineering and hardware engineering constructs. We'll get there in time... and when we do, the world might just be that little bit more equitable for all of humanity, giving some of us who have struggled the helping hand they need and deserve. (E)

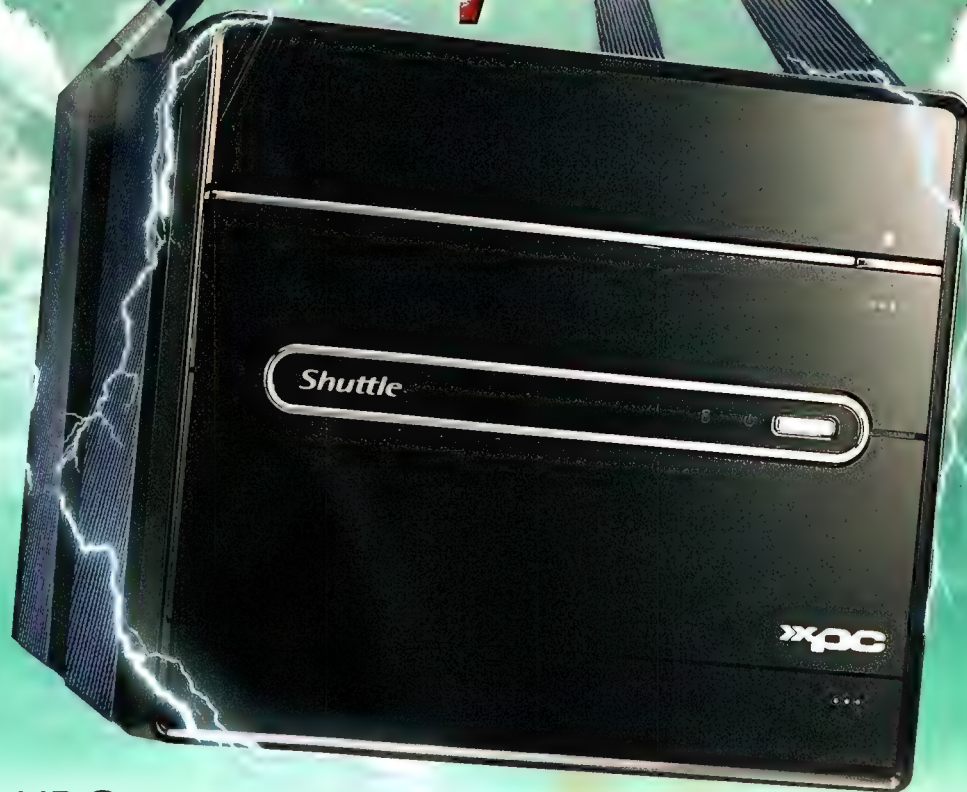


The Autonomos-Labs 'Made in Germany' vehicle, whose primary means of cornering and steering is through the EPOC interface, manipulated via EEG.

Shuttle®

»xpc

Ultimate Reinforcement Fully Armed



SX58H7 Pro Shuttle Gaming XPC

The newer and faster power station! Shuttle SX58H7 Pro features the Intel® X58 Chipset supporting the Intel® Core™ i7 Processors. Featuring the same overpowering interfaces like before, but also includes support for SATA 6G and NVIDIA® SLI™ or ATI CrossFireX™ offering enthusiasts and gamers a crucial platform to gain and achieve the ultimate result and upgradeability.

Are you ready to be equipped?

- Intel® X58 + ICH10R
- Intel® Core™ i7 processor Extreme Edition (or any Core™ i7 processor CPU)
- Triple Channel DDR3 memory, Max.16GB
- 2x PCI-E 2.0 x16 with ATI CrossFireX™ & NVIDIA® SLI™ support
- 2x Gigabit LAN with teaming support
- New Glossy Chassis Design
- I.C.E Heat-pipe
- 500W 80 PLUS® Bronze Certified Power Supply
- Supports 7.1 Channel HD audio, USB 3.0 & SATA 6G
- All Solid Capacitors

ALTECH
COMPUTERS
WWW.ALTECH.COM.AU



NSW

ARC Computers 02 9746 8322
Aus PC Market 02 9646 8000
Digital Star Computer 1800 800 626
Express PC Parts 02 9674 3108
MWAVE 1300 727 446
Internet Tech Corp 02 8004 3033
Online Centre 02 9211 0698

arc.com.au
auspcmarket.com.au
digitalstar.com.au
expresspcparts.com.au
mwave.com.au
i-tech.com.au
onlinecomputer.com.au

QLD

Megabuy
IT & Support Direct
Umart Online

1300 634 228
07 3369 3928

megabuy.com.au
tsdirect.com.au
umart.com.au

WA

Foxcomp
That Computer

08 9331 3643
08 9362 2777

foxcomp.com.au
thatcomputershop.com

VIC

CentreCom
PC Case Gear
Scorpion Technology

1300 007 600
03 9551 0889
1300 726 773

centrec.com.au
occagear.com
scorptec.com.au

NT

Palmerston Computers

08 89325 366

palmerstoncomputers.com.au

SA

Allneeds Comput-
Getright Computers
Hypernet

08 8211 8661
08 8231 0622
08 8340 2021

allneeds.com.au
getright.com.au
hypernetdist.com.au

INPUTOUTPUT

Dan Rutter brings the answers to your questions like no-one else can.



I/O OF THE MONTH

Brain transplants

Is swapping the controller board on a dead hard drive to try to recover the data as bad an idea as the data recovery companies claim?

A friend of my wife's has an ASUS netbook, on which she stores everything, and for which she (of course) has no backup whatsoever – as you say, any data you have which isn't backed up is data you don't want to keep. And of course, the 2.5in hard disk in it gave up the ghost, so she came to me for help.

Powering up the netbook resulted in a delay and 'no hard drive detected'-type messages. Pulling it out I found it was a SATA disk, so I stuck it into a drive dock attached to my main machine (which runs Linux). The drive is identified but times out or responds with garbage to commands sent to it.

The drive is spinning and sounds fine (not varying in speed/etc), so I figured it was the electronics that had gone bad. The friend isn't willing to spend what the professional data recovery companies want to recover it (seems \$600 or so is the going rate if it doesn't need the clean-room treatment) but

would like to try to get digital photos off of it.

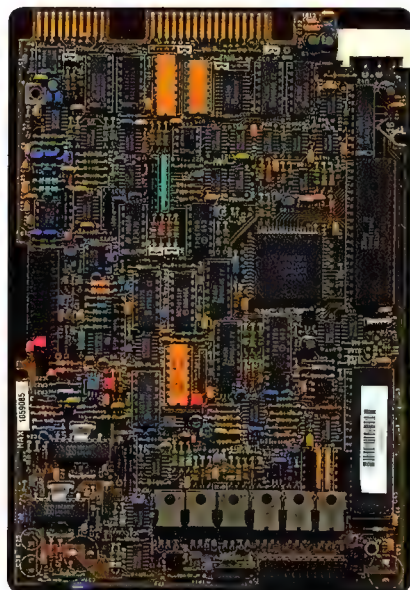
I searched eBay for an identical drive (Seagate ST9160310AS, 160GB from their Momentus 5400.5 series) with the same model, PN (part number?), and firmware version and found one for not much, so it's on its way to me. I've not replaced the board on a hard drive before, though I used to build computers for a living and have disassembled/destroyed enough hard disks for paranoid customers looking for proof their data is wiped that it seems simple enough.

In searching for prices on data recovery, I found a number of firms with advice against swapping controller boards on these drives – though clearly they have a vested interest in you not saving your data yourself. I was wondering, is there anything to these warnings? One reason these warnings sound like marketing to me is that frequently these companies will have exactly the same text on pages for essentially every hard drive model number in existence, like in a link farm.

Charles Cazabon

O This question keeps coming around, and it's difficult to answer, mainly because hard-drive technology keeps getting more and more refined. To drag out the overused automotive analogy, modern hard drives are like modern cars, in that they're much more reliable than they used to be – vastly more reliable, if you're talking failures-per-megabyte – but more and more opaque when something goes wrong.

That said, it is definitely still *possible* to swap the controller board on a modern drive for an identical board – which very probably does mean the same revision and same firmware – and get a drive from which you can recover most, if not all, of the data. Note that this is only about recovering data, not resurrecting the drive; a modern drive with a new controller board on it probably won't be very reliable. If we're being charitable, that could be what the recovery companies are talking about when they say you can't 'fix' a drive just by swapping in a new board. You should only expect the drive to be fixed enough for data recovery, at best.



Controller boards used to be much more fun.

I/O OTM



WINS A THERMALTAKE CHALLENGER PRO KEYBOARD

Whether or not the board-swap makes the dead drive readable, after you recover whatever you can from it, you should rip that drive apart, as is traditional, and extract the fridge magnets and wall decorations.

The list of ways a board-swap can go wrong just keeps getting longer. Even if you don't screw up in some elementary way like not taking anti-static precautions and annihilating the donor drive just by touching it.

A drive with a new controller board attached to it should, for instance, be expected to be significantly unhappy because of good old-fashioned bad-block mapping, where failing blocks on an otherwise healthy drive are invisibly replaced with standby blocks from a section of the drive set aside for this purpose. If the controller board keeps track of the block mapping, swapping in a new controller board can obviously cause problems. At worst, these problems can prevent you from even *reading* some data on the drive, let alone successfully writing to it.

There are more subtleties in recent drives, though. Like, the controller board may be calibrated at the factory to match the individual oddities of the particular head assembly in that drive. The fantastically small tolerances and staggeringly high data densities in modern drives require a lot of this sort of subtle trickery.

Again, though, you may at least be able to read *some* of the drive provided your board is a close enough match, and if it doesn't work, you can at least put the board back on the donor drive and have it work.

Or buy a piano

I I have a cat, called Boris. Boris walks on my keyboard. All the time. Sometimes I come back to the PC and I swear he's been trying to see if one cat can write Shakespeare faster than a million monkeys.

I usually deal with this by just opening an empty browser tab and leaving that as the active window. Boris hasn't figured out how to do Ctrl-Alt-Del yet, so about the worst he can do to a browser tab is sit on F1 and open hundreds of Google Chrome Help tabs. But there has to be a better way.

I tried a couple of 'anti toddler' utilities that're supposed to lock your keyboard until you press some key combination that toddler hands can't reach, but they just... didn't work, at least not on 64-bit Win7. So rather than troubleshoot the software, I grabbed the chance to solve the problem in hardware!

Surely you could easily make a switch that interrupts the keyboard signal, for USB or PS/2. They both only have four conductors, and I bet you could just interrupt one data wire with a basic single-pole toggle switch. But I also remember being warned never to plug or unplug PS/2 devices with the computer turned on, because it could blow a motherboard fuse or something.

So could a \$2 keyboard cable switch cost me \$200 for a new motherboard? Do you need to switch all four wires?

Nicholas Keys



O You could indeed probably harmlessly disable a PS/2 keyboard by switching only one data pin; pin one on the DIN connector is data for a PS/2 keyboard (go to pinouts.ru for all your pin-identification needs!), and pins two and three are data for USB. You can in theory blow a PS/2-port fuse by connecting and disconnecting the power and ground pins, but if you don't switch those I think you'll be fine. USB is more robust, but you'll have to wait a couple of seconds between re-'connecting' your keyboard before you can use it.

Tell you what I'd do in this situation, though: Buy the finest, cheapest KVM (Keyboard, Video, Mouse) switch I can find, and just not plug anything into one of its sets of sockets. Switch from your keyboard to an empty socket, and the keyboard's locked out.

The PS/2-and-VGA switch in the picture cost me \$6.05 delivered on eBay. It runs from keyboard-port power, and works fine with my monster vintage IBM keyboard. Like other dirt-cheap KVMs, this one came with no cables, but all you need for this project is one PS/2 cable. That'll only cost you a couple of bucks delivered.

We never had these problems with punched cards

I I have an external hard drive that I'm re-purposing, so I've taken all the data off of it and reformatted. I know that formatting always takes up some space, and there's some difference between the powers-of-10 the manufacturers use to calculate space versus the powers-of-two the operating system uses (you've mentioned this yourself on one or two occasions... maybe three or four), but what I saw afterwards has me really confused.

The advertised disk space on the drive's sticker is 320GB. I used the NTFS file system when I formatted it, and now Windows reports that there's 298GB of available space. All good so far, and what I was expecting.

However, it also reports there's 319,966,433,280 bytes of free space (I've attached a screen shot to illustrate). So, what gives? Why is Windows telling me there's almost the entire 320 gigabytes free, but it's only letting me access 298? If it makes a difference, this is on Windows 7 32-bit.

Michael Shannon

O On exactly one thing, the people who insist a megabyte is a million bytes agree with the people who insist a megabyte is 1,048,576 bytes: A byte is eight bits. So byte-counts are the same for both systems.

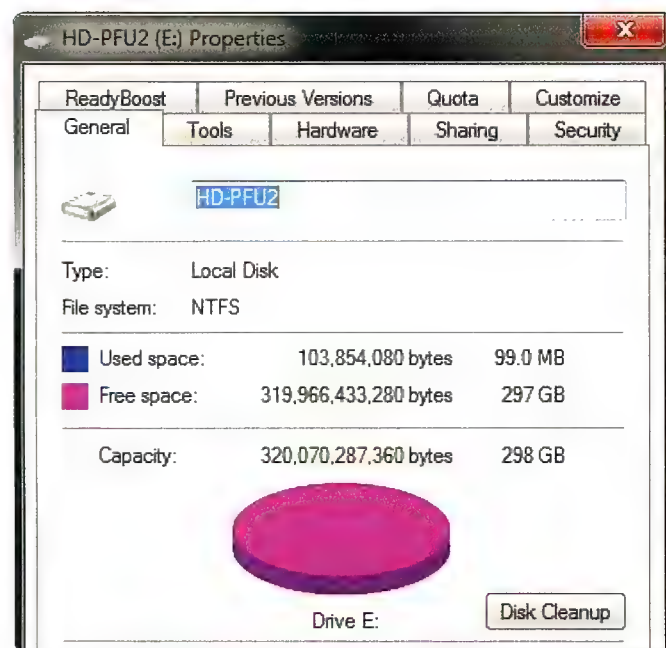
If we use the kilo-, mega-, giga- prefixes to mean powers of ten, and kibi-, mebi-, gibi- et cetera to mean powers of two, your very-nearly-320-billion bytes adds up to 298 gibibytes, and 320 gigabytes.

A byte isn't necessarily eight bits, by the way. Early computers used bytes with several odd lengths, and there's also the concept of the 'word', which is the amount of data a processor deals with at a time. Just the other day I was reading the first of Charles Sheffield's 'Proteus' books, which on the first page has people in a future world when all medicine has been superseded by wholesale bodily re-engineering being taken back by something that requires 'four billion words' of computer storage.

A modern PC has, at most, 64-bit words, making four billion words only 29.8 gibibytes. Even if you say that's RAM, not drive space, it's trivially little for a future world with space colonies and people turning themselves into birds.

If we presume the future computers have some monstrous word-size like 2^{24} bits, then four billion words becomes a more impressive 7,812,500 gibibytes. But drive capacity has been increasing in a pretty good exponential curve since about 1980.

If that continues, we'll have drives exceeding 7,812,500 gibibytes before 2030.



I dream of the day when this stuff is obscure trivia.

Stuff

And things... with that Ashton guy.

A geek accumulates. Different things in different ways – knowledge of the arcane and sublime, achievements both real and virtual, power for their eventual world domination...

And stuff. Lots of it. A veritable wizard's tower of old PC parts, software, game boxes, magazines, models, modems, routers, and more. Most of it is probably junk, but holds some sentimental value. Some of it is probably useful, waiting for that rare time when that use comes to bear. And some of it may actually be valuable in the antique sense.

I could build roughly three complete PCs of various age, but I have many more parts than the sum of which could create a PC. Take hard drives – I have 23...

So when I moved house recently and had to pack and then unpack the Man Cave, and in the process got to see just how much stuff I really *do* have, I thought it'd be fun to catalogue it a little. I mean, what else would you do on a Saturday night, right?

For me the predominant accumulation of stuff, aside from magazines and books (the majority of which are all tech or sci-fi) is components. I could build roughly three complete PCs of various age, but I have many more parts than the sum of which could create a PC. Take hard drives – I have 23 sitting neatly in a draw now (organised so thanks to She Who Is Not Normally Allowed To Enter). They range from a 14-year old 4.5G IBM Ultra SCSI drive to the 1TB WD Black SATA from my last PC build before my current one. In that time capacities have increased over 600 times when compared to today's 3TB drives.

The largest number of bits goes to network cables, mostly CAT5 with some CAT6 – 31 in

all, of lengths up to 20M. Not far behind this is a collection of SATA cables from various motherboard upgrades totalling 29, followed by 19 USB cables of every socket and size.

For some reason I have a lot power cables, around 20, which mysteriously outnumber the number of PSUs in use and spare, which total five (ranging in power from a silent fanless 300W to a beefy 1000W). I even have four CPUs lying around, two recent Intels and two classic AMDs, including my beloved Athlon 64.

She Who Likes To Organise has asked why I

MGA powered card from 1995. A single 8MB RAM extension I bought for it cost, at the time, as much as a whole GTX 570 today. That's how far we've come.

There's other bits of course – heatsinks, molex power cables, audio cables, DDR and DDR2 memory, network cards, and an old Shuttle PC that used to be my Uber Linux Box.

A lot of it is stuff. Some of it is sentimental. And just a little is an awesome slice of our tech history that I want to hold on to.

How much stuff do you have? And is any of it valuable to you? Let us know in the Tech Talk subsection of the forums – we'd love to know.

Man – that's a lotta stuff!
amills@atomicmpc.com.au

still have all this stuff... a fair question. I dodge it by asking if she'd like to sort my network cables by length, and her eyes light up.

But it's true I don't need most of this. Some have uses, like long cable runs for LAN days, and spare PSUs have come in handy at times (see last month's Technica Obscura) but I could certainly do with giving some of it away to the local reverse garbage market, as a good friend of mine recently suggested. Heck I still have an Iomega Jaz drive here – brilliant for its time, 1G hard drives on a cartridge – that I really don't think I'll be using again.

But there are some sentimental items. I have six sound cards including two of the game-changing Gravis Ultra Sound (circa 1992) with onboard memory, an Aureal Vortex 2 (first real 3D positional sound) powered Diamond, and an Sound Blaster Audigy.

My video cards include gems like the 3Dfx based Orchid (from the dawn of accelerated 3D), a GeForce 4 AGP from Albatron, and a Matrox





MIONIX™

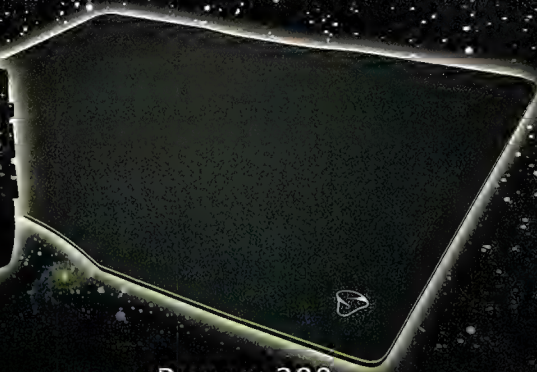
LIGHT-YEARS AHEAD OF THE GAME



NAOS Series
Pro Gaming Mice



ZIBAL
Mechanical Gaming Keyboard



Propus 380
Premium Gaming Surface

WEDEN'S NEWEST SHINING STAR, AND COOLEST CASES, ALL AVAILABLE DOWN UNDER

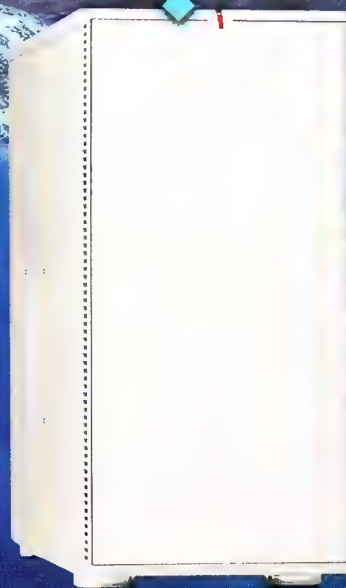
fractal design



Define R3 • Arctic White
Limited Edition



Define Mini
Micro ATX



Arc Midi Tower
Mini-ITX/Micro ATX

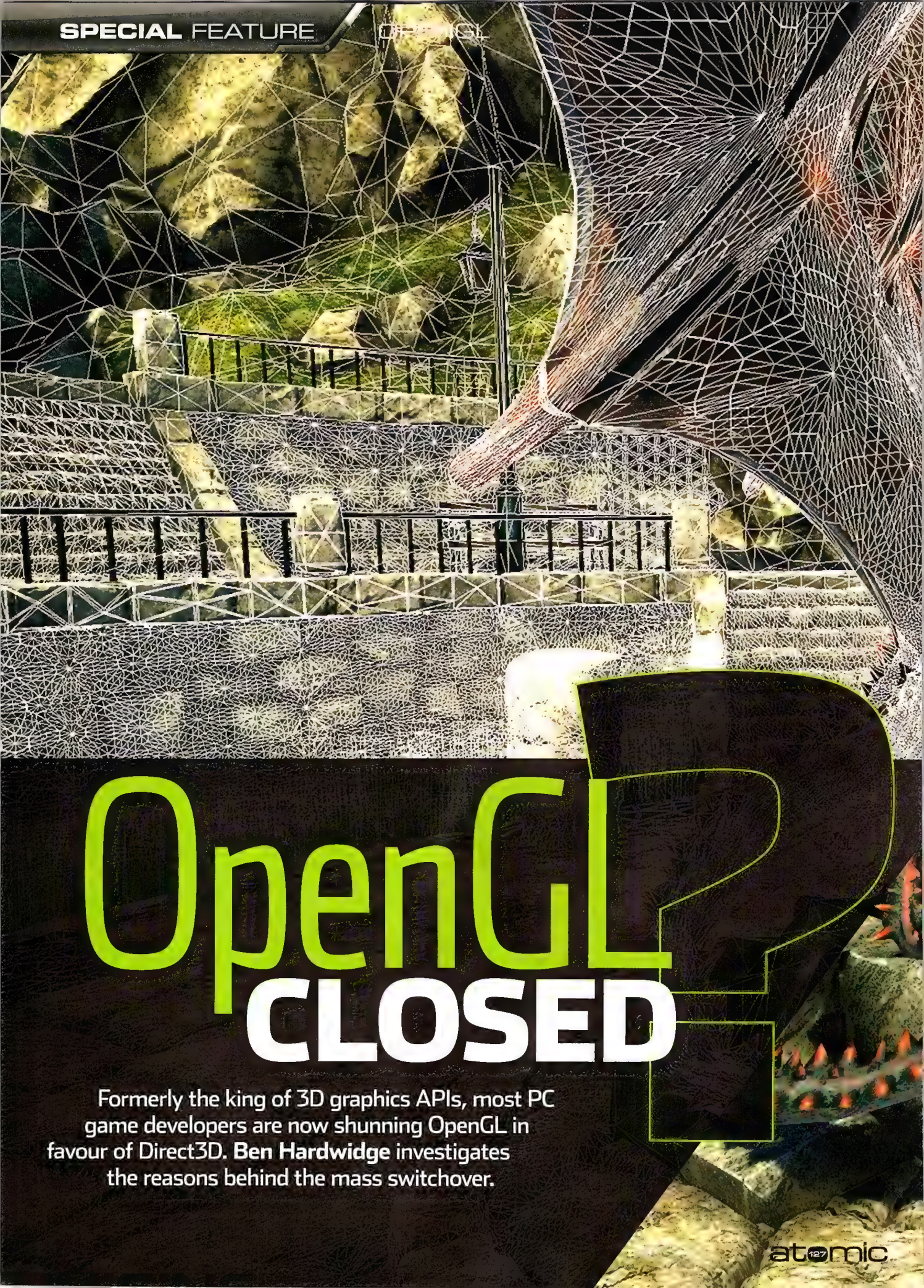
www.anyware.com.au/fractaldesign

www.anyware.com.au/mionix

anyware is a wholesaler and does not sell direct to public. The above products can be purchased from most independent computer dealers throughout Australia. Call the number above for your nearest reseller.

Anyware™
(COMPUTER ACCESSORIES)

PH: 1300 269 927



OpenGL CLOSED

Formerly the king of 3D graphics APIs, most PC game developers are now shunning OpenGL in favour of Direct3D. **Ben Hardwidge** investigates the reasons behind the mass switchover.



OpenGL isn't dying, dead or any other adjective that you can imagine John Cleese reciting in a silly voice. The open-source 3D graphics API is still immensely popular with 3D workstation users, and OpenGL ES is also proving to be a hit with mobile game developers. It's important that we establish this first, before anyone thinks – even for a second – that we're hammering out OpenGL's funeral march on the office organ.

However, there's also no escaping the fact that the alternative 3D API seems to have fallen out of favour with PC game developers. With the notable exception of games based on id's Tech Engines, World of Warcraft and occasional indie games such as Minecraft, most PC games are now based on Microsoft's Direct3D API. New GPU architectures are marketed on the basis of which version of DirectX they support in hardware, while support for the latest DirectX version is also a selling point of new games for enthusiasts.

When it comes to PC gaming, Direct3D is sitting comfortably in a stretch limo, taunting OpenGL as it attempts to keep up on its BMX. This is a remarkable achievement for an API that only 12 years ago was seen as a poor man's renderer compared with superior alternatives such as OpenGL and 3dfx's Glide. Why are PC game developers now turning their backs on OpenGL?



When OpenGL was King

To gain some understanding of the reasons for this mass switchover, it's worth taking a look at the early history of 3D APIs. "We have traditionally had several reasons for using OpenGL over Direct3D," says CEO and co-founder of id Software, John Carmack. Id has notably stuck with OpenGL for decades, despite Direct3D's increasing popularity. "In the early days, Direct3D was just awful," says Carmack, "and even through Doom3's development, OpenGL provided less of an API-overhead."

Back then, there was a palpable sense of competition between 3D graphics APIs. Look at the graphics options in Valve's original Half-Life game – not only are you able to choose the resolution and the usual graphics settings, but you also have a choice of rendering modes. This includes Direct3D and OpenGL (the latter performed much better at the time), as well as support for the 3dfx mini-GL system. Perhaps more importantly, though, it also includes the option for software rendering.

At this time, 3D accelerators were seen as a luxury add-on for gamers, rather than a standard feature of all graphics chips, so game developers had to include support for software (CPU) rendering as well as hardware 3D rendering. This made sense for all 3D graphics APIs in the late 1990s, but support for software rendering has since become one of the major differences between OpenGL and Direct3D. Basically, OpenGL supports it, but Direct3D hasn't supported software rendering for over a decade.

"One of the better features of DirectX is that it doesn't allow software fallbacks," explains

AMD's worldwide developer relations manager for GPUs, Richard Huddy. "In the workstation area, where you need to know that a pixel will be rendered according to the spec, it's okay to insist on software fallback, but that would be irresponsible for games. I remember those dialogues back in the days of DirectX 3 and 5, when people asked, 'Should we have software fallback if the hardware can't do such and such?' and the flat answer is no – the correct answer for DirectX was definitely no."

This trend with regards to backward compatibility continues today. It's important for OpenGL to retain backwards compatibility so that 3D professionals know that their code will work. Although the Khronos Group boasted that it had stripped out a great deal of the legacy code in OpenGL 3, some games developers we spoke to said that this stripping process hadn't gone far enough.

"DirectX doesn't care about backwards compatibility between major releases," says Michael Glueck, R&D technical director at Crytek. "For example, Direct3D 9 and 10 are very different. Although this can be annoying for developers at first, it makes the API cleaner and consistent, and allows you to fix former design mistakes. OpenGL never had such a hard cut, as backwards compatibility is important for the non-gaming 3D industry. There are definitely improvements in OpenGL 3, but even though some ancient features were dropped from the core profile, the API style is still the same."

In the late 1990s, many 3D games ran on 3dfx's Glide API or OpenGL, rather than DirectX. After all, id Software was the king of 3D engines at this time, and the Quake engines used

OpenGL as standard. As Carmack pointed out, OpenGL was ahead of Direct3D for a long time, particularly in terms of performance.

As such, it made sense for cutting-edge game developers to use OpenGL, rather than DirectX, at this time. However, if you look at the OpenGL spec now, you can see that it's now playing a gradual game of catch-up with Direct3D in terms of new hardware 3D gaming features.

"The actual innovation in graphics has definitely been driven by Microsoft in the last ten years or so," says Huddy. "OpenGL has largely been tracking that, rather than coming up with new methods. The geometry shader, for example, which came in with Vista and DirectX10, is

John Carmack,
co-founder of id software.



wholly Microsoft's invention in the first place, and exposing it in OpenGL makes perfectly good sense."

Huddy also adds the caveat that the development of features such as the geometry shader isn't just down to Microsoft, but is also helped by game developers and GPU makers at Microsoft's graphics advisory board (GAB) meetings, which we'll discuss later on.

So while OpenGL may offer what looks like a rough feature parity with DirectX, this usually arrives considerably later. For example, OpenGL 3.2 introduced support for the geometry shader, but this didn't turn up until August 2009 – a year and a half after the release of DirectX 10 with Windows Vista.

Death by Extensions

Not only that, but the introduction of these new features isn't as straightforward as you might think. While support for new shaders is an integral part of DirectX, new technology such as this can usually only be introduced to OpenGL via its extensions system.

"The extension system was written around 15 years ago – long before anybody knew what a shader was," explains Introversion's lead

as tessellation have to be exposed through extensions in the first place – and that's difficult for the ISVs, especially if they're working with multiple extensions from different people that might handle other areas in different ways."

In some ways, extensions are also a benefit of OpenGL, however. They give the API a degree of flexibility, as well as giving game developers a choice about how they manage certain aspects of the 3D pipeline. "We still hope to get some extensions for improved VBL (vertical blank) sync and possibly some direct texture access extensions for Id Tech 5," says Carmack, with regard to the development of id's latest 3D engine, which will form the basis of the company's new game, *Rage*.

However, even this benefit of OpenGL is now becoming less pronounced, as so many graphics cards feature similar hardware support. AMD and Nvidia may have different GPU architectures, but they still basically support the same features, as they need to support DirectX. "The ability of individual vendors to make extensions isn't as valuable as it used to be," says Carmack, "due to the generally more complete coverage that they all have."

Basically, while OpenGL looks like it has a

as the latest version of DirectX3D," says Crytek's Michael Glueck, citing "multi-threading support and API consistency" as weak areas for OpenGL. Carmack concurs, saying that "Direct3D handles multi-threading better, and newer versions manage state better".

Access to GPGPU Compute

In addition to its superior handling of multi-threading, DirectX also has another big feature in its favour – Direct Compute. While GPGPU computing is still in the fledgling stage when it comes to mainstream general-purpose software, it's already a big deal for cutting-edge game developers, as it effectively opens up the power of the GPU for any task, and it's all in the same API too.

"The Direct Compute part of DirectX 11 has been one of the best-used parts of DirectX," explains Huddy. "When you're post-processing your frame buffer, which almost everyone does these days, to convert from one kind of format to another, or to add various effects such as depth-of-field or blur, the logical way to do it is not through some convoluted pixel shader; this way, you have quite a difficult job of picking up the adjacent pixels, processing them and turning them into the final colour result that you want. It's much more natural to do that in the Compute Shader – you don't typically want access to the Z-buffer, but even that can be arranged if you write your compute shader the right way."

However, GPGPU post-processing is a little more complicated in OpenGL, as again this isn't a feature built into the API as standard. "In the OpenGL world, my understanding is that you'd lean on OpenCL for that compute approach to the GPU," says Huddy, "which is actually a little unfriendly."

When you add it all up, you can see why OpenGL looks less appealing to top-end PC game developers. In fact, even Carmack, who's

While OpenGL looks as if it has a rough feature parity with Direct3D, the reality is more complicated.

designer and developer Chris Delay. "It was designed for quirky platform extensions that you might use every now and then, whereas now if you write your graphics engine in OpenGL, your entire graphics engine will be going through that extension system."

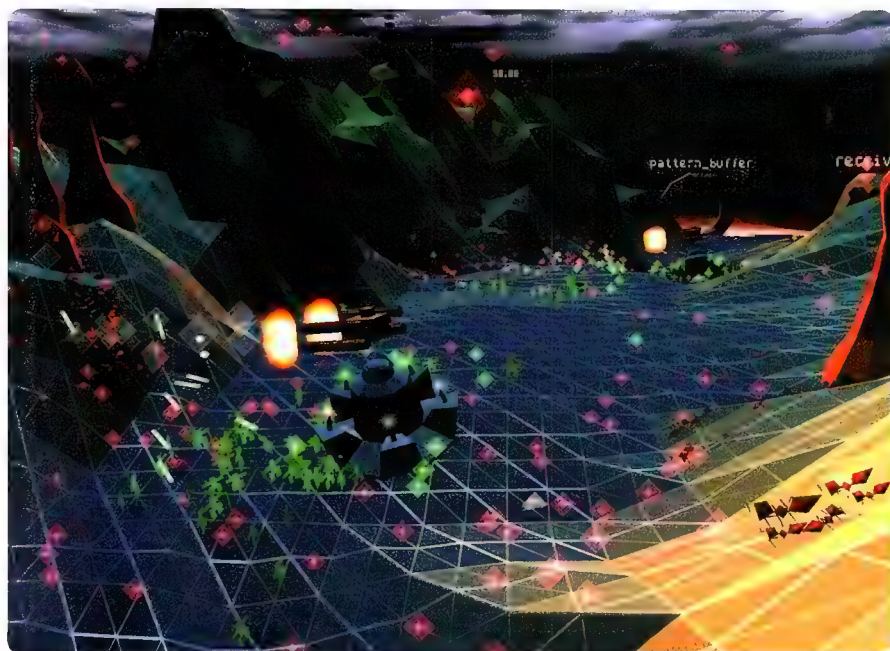
This isn't a big issue for Introversion, as its simple but stylish graphics in games such as *Darwinia* don't use shaders anyway. In fact, *Darwinia* was programmed in OpenGL initially, and then ported across to DirectX later. However, the extensions system can be a pain for cutting-edge game developers, and not just because it's a clunky way of bringing shaders into the API.

"You don't get competition on extensions," points out Huddy. "One of the scary things about OpenGL – it's part of its power, but it's also part of its problem – is extensions. It's a natural way to handle the fact that sometimes you'll come up with a piece of hardware that has an ability that's just a little greater than OpenGL, so you expose it through an extension. But the trouble is that the extensions aren't approved by anyone – they're a private development, so it's difficult for an ISV [independent software vendor] to know which one to choose."

"Which extension should a game developer choose for efficiently handling vertex buffer arrangements in memory – Nvidia's extension, or AMD's extension? That's a tricky mess. The vertex buffer is properly integrated into OpenGL 2, but relatively new innovations such

rough feature parity with Direct3D, the reality is more complicated than this. The game developers that we spoke to also pointed out that there are other areas where OpenGL is now lacking in comparison with Direct3D.

"Although OpenGL has caught up in the recent years, it's still not fully on the same feature level



stuck faithfully by OpenGL for years, told us, "I actually think that D3D is a rather better API today. Microsoft had the courage to continue making significant incompatible changes to improve the API, while OpenGL has been held back by compatibility concerns."

While Carmack is still sticking with OpenGL, despite the apparent superiority of DirectX with regards to games, other developers have abandoned the open-source API. One example is Crytek – the company's first big game, *Far Cry*, ran on OpenGL, but *Crysis* only ran on DirectX3D. "Unfortunately, OpenGL lost its feature parity with DirectX several years ago," says Crytek's Michael Glueck, "and started only catching up again recently. Considering that, there was no reason for *Crysis* to support two different graphics APIs, as it would just have complicated development."

The DirectX Factor

Technically, DirectX3D is a superior API to OpenGL when it comes to PC game development in the modern era, and it's also now the trendsetter in terms of new graphics features, but these aren't the only reasons for its success. One of the major reasons for DirectX's popularity is simply the way it's marketed, not just by Microsoft, but also by hardware manufacturers and game developers alike.

Huddy likens the launch of a new version of Direct X to the launch of a new console, when customers, software developers and hardware manufacturers are excited by the potential for the new technology. There's a set timetable for the launch of a new version of DirectX, which is sometimes also accompanied by the launch of a new operating system.

"As Microsoft has become more



Technically, DirectX3D is now a superior API to OpenGL for PC game development, and it's also the trendsetter.

predictable about hitting its timetables with a new OS or DirectX update, so the partners involved on the hardware side have found it easier to target their stuff," says Huddy. "We now aim to come along two or three months before the operating system will be ready to ship with our candidate piece of hardware, and that actually gives us a good chance to work

with the ISVs and make sure that their launch games are ready when the OS arrives."

This brings us back to Microsoft's GAB meetings that we mentioned earlier. These occur on an annual basis, or sometimes on a six-monthly schedule, and bring together software developers, hardware manufacturers and Microsoft staff to discuss the specification of the next version of DirectX. According to Huddy, the original idea was to develop a new version of DirectX every year, but this has since been extended to around three years.

When everyone can safely predict that there will be a new version of DirectX every three years, then companies can start to organise the development of their new products and marketing to coincide with that launch. "The predictability is very helpful for hardware vendors," explains Huddy. "If we're trying to design a new piece of hardware, then knowing when the next version of DirectX will arrive, and having the game developers coordinated on that kind of timing, particularly if they don't just hit regularly but hit the inflection points, like arriving in time for back-to-school sales that we see in the late summer, that's a really big driver of sales."

This doesn't just affect GPU manufacturers and game developers though. When the launch of a new version of DirectX coincides with a new operating system, you also have board partners and PC manufacturers jumping on board, wanting to make sure that their latest kit can be advertised as supporting all the latest features in the new OS.

The notable cock-up with this strategy was, of course, the Windows Vista launch. Not only did Vista's new driver model create a lot



**YOU DON'T STORE
YOUR MUSIC ON
CASSETTE TAPES
ANYMORE...**

**WHY WOULD
YOU STORE
YOUR DATA
ON A HARD
DRIVE?**



**SAVING
SOLID STATE DRIVES**

Still using a hard drive? Whether you place a premium on sheer performance, enhanced battery life, or superior durability, you can't go wrong with an SSD upgrade. And with our SSD expertise, we've designed the fastest, bang-for-the-buck drives on the market.



MAX PERFORMANCE*

Read: up to 150MB/s • Write: up to 130MB/s
Random Write IOPS (Aligned): over 100k IOPS



OCZ
Technology
OCZTECHNOLOGY.COM

the SSD experts!





of problems with multi-graphics cards setups initially, but the new version of DirectX (10) also only worked with the new OS. This created a lot of issues for game developers, who had to create games using two renderers if they wanted to use the latest DirectX 10 features, and provide compatibility with the much more widespread Windows XP operating system.

"Targeting Vista for DirectX10 was a major issue," says Huddy, "since Vista's take-up wasn't terribly good and, most importantly, Microsoft targeted a new operating system with a new version of DirectX. That was problematic, as you just couldn't tell how many DirectX 10 machines were going to be out there."

The teams behind DirectX have clearly learned from this mistake, though. Running on both Windows 7 and Vista, the launch of the new version of DirectX could be safely accompanied by plenty of new games. In fact, both *Stalker: Call of Pripyat* and *Battleforge* had DirectX 11 support before Windows 7 was even launched.

In simple terms, the launch of a new version of DirectX is very carefully coordinated, generating a lot of excitement and money for the industry, and effectively creating an opportunity to sell a lot of gear and software for those involved. Compare that with the launch of a new version of OpenGL, which recently has simply involved just a few announcements from The Khronos Group (the group that controls the specification of the API), and adding support for features already found in Direct3D. You're not going to sell a new gaming PC based on its support for OpenGL 4, but you'll certainly incite interest with support for DirectX 11, particularly at the time of launch.

Once you have so many games and hardware manufacturers on board, the rest follows.

"Direct3D is more proven in game development," says Crytek's Michael Glueck. "It offers more useful development tools and the graphics driver quality is better in general, due to the huge number of shipped games. OpenGL is catching up in all these areas but at a relatively slow pace."

The quality of drivers is a key issue, and OpenGL has had a bumpy time with this in recent times. Even now, Huddy says he isn't "sure whether our DirectX 11 features are fully matched in the OpenGL drivers at the moment – I'm not sure where our OpenGL drivers stand right now on tessellation behaviour, for example".

However, OpenGL driver support is better now than it has been in the past. "Around the time when DirectX reached version 5 or 6, a lot of developers switched to it en masse, since at the time OpenGL had a bit of a driver support problem," says Introversion's Chris Delay.

So why use OpenGL?

Despite all these apparent advantages, though, some PC game developers still stick faithfully by OpenGL. Why?

There are several reasons, depending on the developer, but one of the key features of OpenGL is cross-platform compatibility. After all, DirectX only gives you immediate compatibility with Windows and the Xbox 360; if you want your game to run on Mac OS or Linux then OpenGL is your best option. OpenGL also works on the PlayStation 3, although game developers such as Crytek say they prefer to use Sony's low-level 3D API instead, and build a DirectX-style software layer on top of this to make cross-

platform programming easier. Basically, you can write a game in Direct3D and still port it across to the PlayStation 3 easily enough.

Either way, OpenGL's cross-platform nature is a clear benefit to game developers looking to run their games on every platform possible, especially when it comes to mobile games. "All our games are available for Mac and Linux as well as Windows," says Introversion's Chris Delay. "We've also been experimenting with the iPad and iPhone, again using OpenGL, so all those new mobile platforms – and in fact, all consoles except for the Xbox – have wonderful OpenGL support. So for that reason alone, I think OpenGL has a strong future."

That's fine for Introversion, as its games don't really challenge the latest PC graphics hardware, and it's beneficial for the developer to get its games onto as many platforms as possible. However, the cross-platform nature of OpenGL isn't such an obvious benefit for top-end PC game developers.

"OpenGL offers portability to PC, Mac and Linux platforms," notes Carmack, "but Direct3D 9 offers portability between the PC and Xbox 360, which is clearly a more powerful argument." Carmack is also notable for having created mobile versions of some of id's franchises, such as *Rage* for the iPhone, but this doesn't benefit from OpenGL's cross-compatibility. "Mobile uses OpenGL ES," says Carmack, "but there really isn't much of any code sharing between our mobile and console efforts."

While OpenGL can be run on multiple platforms, however, it doesn't always offer the same features on each platform when it comes to binary shader support. Conversely, Glueck

says that while DirectX only runs on Microsoft platforms, it's at least consistent on different versions of Windows, which effectively enables it to be run efficiently on a high number of Windows PCs.

"The Direct3D shader binaries work on all Windows platforms," explains Glueck, "so we have a server that generates every possible shader combination based on our features and it takes some time. For OpenGL, with no binary shader support across all platforms, and especially no guaranteed compatibility on future devices even from the same vendor, the player would have to wait until all those shaders were generated on his local machine. Nobody wants that. Sadly, even the binary shader support in OpenGL 4.1 doesn't seem to be cross-platform."

So what is it that keeps Carmack and id in the OpenGL camp? "It's really just inertia that keeps us on OpenGL at this point," admits Carmack.

"OpenGL still works fine, and we wouldn't see any huge benefits by making the switch, so I can't work up much enthusiasm for cleaning it out of our codebase. If it were just a matter of the game code, we could quite quickly produce a DirectX PC executable, but all of our tool code has to share resources with the game renderer, and I wouldn't care to go over all of that for a dubious win."

Once a developer has built its entire codebase around OpenGL, there seems little point in shifting over to another API for the sake of a few extra features, particularly if you're a developer such as id, which will sell plenty of games whether they're based on OpenGL or DirectX3D.

Interestingly, Introversion's Chris Delay also put his inclination towards OpenGL down to personal preference. "It's like Canon vs Nikon with photographers," says Delay. "Once you've chosen one, you stay with it forever, and I think that might be true with graphics APIs."

In Delay's case, OpenGL was the API with which he started 3D programming in the late 1990s. "It was really big then," says Delay, "and DirectX kind of sucked – it was pretty dreadful – so OpenGL was a clear choice. I just stuck with



crucial difference is that OpenGL will also let you program in a much less efficient method, which is much quicker to get running – a sort of prototyping method if you like.

"It's like an immediate mode, so you can basically just render something very quickly using OpenGL with very simple code. It's extremely inefficient, but it's perfect for prototyping when you just want it to be up and running quickly, and you don't really care about running it at a massive frame rate. However, DirectX doesn't really let you do that at all – DirectX insists that you always execute it in the proper way."

Competition is good

Despite its current unpopularity with many PC game developers, there are plenty of reasons why OpenGL still has a strong future ahead of it. Its strong backwards compatibility makes it popular with 3D professionals, and OpenGL ES is also very popular with mobile 3D game developers.

However, now that DirectX is so far ahead of OpenGL in terms of adding new features, as well as strong driver support, there's little reason for a PC game developer to use it, other than

is also good for competition in the industry. OpenGL may not command the massive share of the games market that it had a decade ago, but the fact that OpenGL is still nipping at DirectX3D's heels continues to put pressure on Microsoft to innovate further.

"It's not a battle of ideologies as it was ten or 15 years ago," says Huddy, "but in any market, competition is a good thing. If we dropped our support for OpenGL, and said that we're never going to release another OpenGL driver, then there's a sense in which Microsoft's decisions start to dictate to us. By keeping the competition there, we keep both of those groups honest, and that's only a good thing."

'It's really just inertia that keeps us on OpenGL at this point,' admits Carmack. 'OpenGL still works fine'

it ever since – I know OpenGL really well now, and I don't know DirectX nearly as well."

As Introversion isn't currently using any complex shader extensions in its games, its main focus is the core API, which Delay describes as "an absolute joy to work with". According to Delay, a part of the appeal of the basic OpenGL core is its ability to run simple prototypes of code with the minimal amount of effort.

"In OpenGL, you can use graphics the proper way, with a decent frame rate and hardware compliance, just like you can with DirectX, and it's very fast," says Delay. "But the

familiarity or the need for cross-platform support. This is particularly true for games that don't make high demands of the hardware – OpenGL could give you an easy way to make your iPad game work on a desktop PC, particularly as it won't be using complicated shader binaries.

Also, while OpenGL is currently tracking the development of DirectX, rather than overtaking it, the fact that there's still a strong second API



STINGER GOLD OVERCLOCKED



FEAR THE STINGER

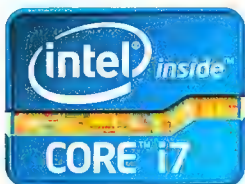


NOT THE SCORPION



HANDCRAFTED
TO
PERFECTION
SCORPION TECHNOLOGY

All Stinger GOLD **Overclocked** systems go through extreme testing, and are handcrafted to perfection. The Stinger GOLD **Overclocked** is a high end gaming machine perfect for any hard-core enthusiast.



GIGABYTE™



CORSAIR®



Intel Core i7 2600K (Up to 4.4GHz!)
Gigabyte UD7 Z68X Chipset
Corsair 16GB Kit (4x4GB) 1600MHz DDR3
2x Gainward GeForce GTX570, 1280MB GDDR5
OCZ 120GB Vertex 3 Series SSD
Western Digital 2TB Caviar Black
LG Blu-Ray Burner, HD Audio, GB LAN
Antec Dark Fleet DF-85 Gaming Case
Corsair 1000W PSU
Corsair Hydro Series H70 CPU Cooler
Windows 7 Home Premium 64 bit

www.scorptec.com.au

Phone: 1300 726 770

Pricing & Spec. subject to change, Errors and Omissions Excepted - All Rights and Trademarks are property of their respective owners

HARDWARE

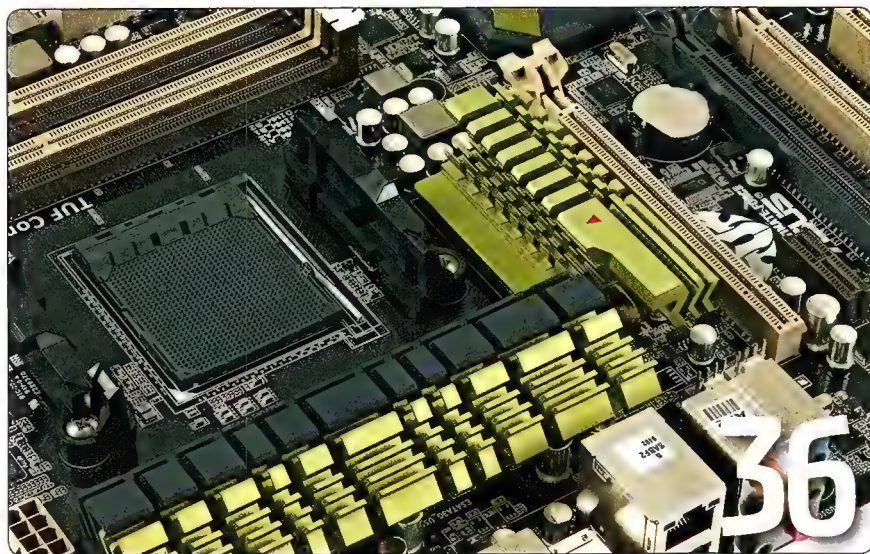
NEWS, REVIEWS AND ROUNDUPS ON THE LATEST HARDWARE

If you're a fan of hardware – and given you're reading this, that's probably a pretty safe bet – you'll know that there's no bigger event in the world than Computex. It's a week of tech goodness that would make any self-respecting geek drool (hopefully not on the tech).

This year, we borrowed the great John Gillyool from our sister publication and shipped him off

to Taiwan to get all the latest on all the tech that you'll be loving over the next year and beyond. Check out his report over the page.

If you're more interested in the here-and-now, check out our massive motherboard round-up, as well as our take on the newest bits of kit we could get our hands (and occasionally other bits) on. Good times...



HARDCORE CONTENTS

SPECIAL REPORT

Computex 2011 32

MOTHERBOARDS

ASUS Sabretooth 990FX 36

GIGABYTE 990FX 38

MSI Z68A-GD80 B3 39

PERIPHERALS

Razer Onza Tournament Edition 41

GIGABYTE Aivia gaming mouse 41

Razer Chimaera headset 42

GT2 Wheel/Pedals 42

CASES

Corsair 600T 43

NOTEBOOKS

MSI GT680-055AU 45

HEAD 2 HEAD

P67 Motherboards 46

KITLOG 60

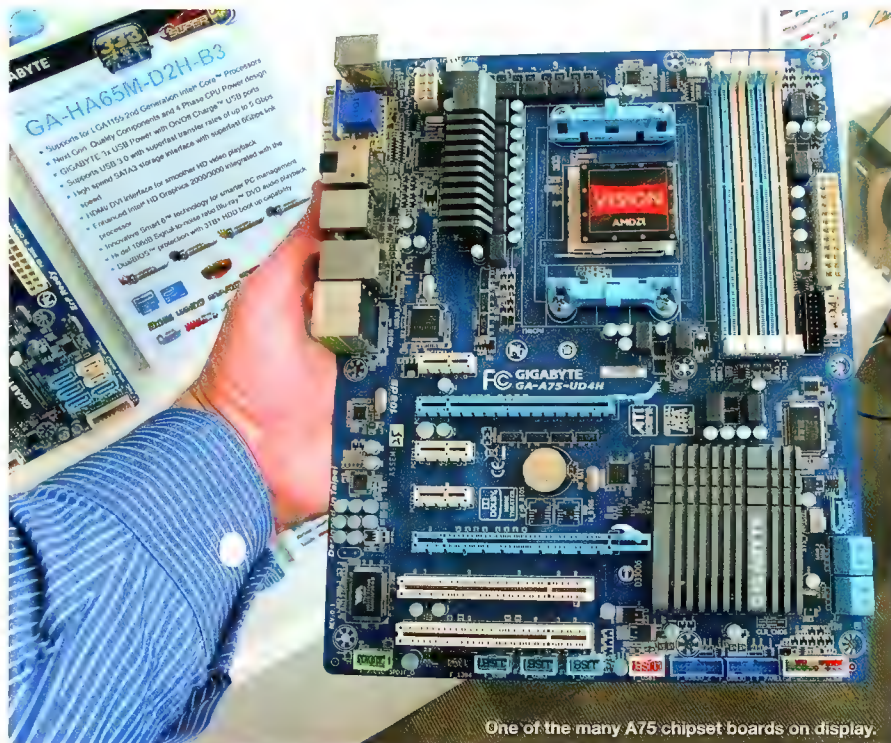


Computex 2011

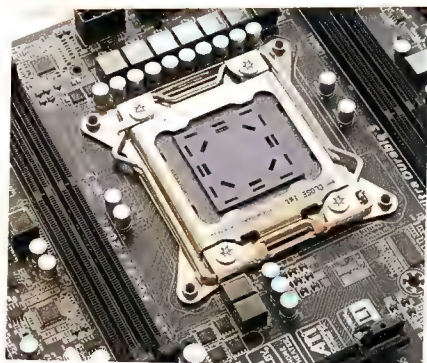
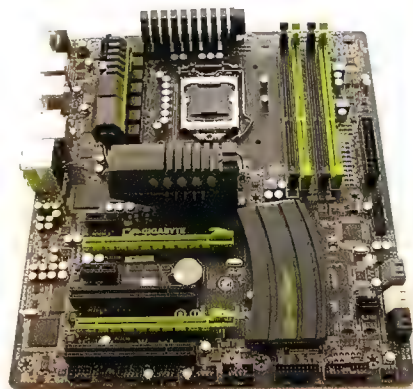
Atomic makes its annual visit to the world's second largest Computer show to discover the tasty new tech due later this year.

At the start of June each year the world's tech journalists make a pilgrimage to Taipei for the Computex trade show. Now in its 31st year, this is the place where we get a glimpse at the components and technology coming down the pipeline. In many ways it acts as a barometer of the industry, showing not only how confident manufacturers are feeling, but also indicating which products will come to the forefront in the coming year.

Computex 2011 was a weird one in this regard. There was very little on show that could be considered new, thanks to the timing of this year's big tech launches. It came just after Intel launched the Z68 chipset, and weeks before AMD unveiled its Llano mobile APU. It also didn't help that AMD's Zambezi desktop CPU and Intel's Sandy Bridge-E processors aren't expected until later in 2011, or that the flurry of graphics card launches are done for the year.



One of the many A75 chipset boards on display.



Top: Gigabyte's G1 line moves to the Z68 chipset;
Bottom: A sneak peek at Socket 2011 for the X79.

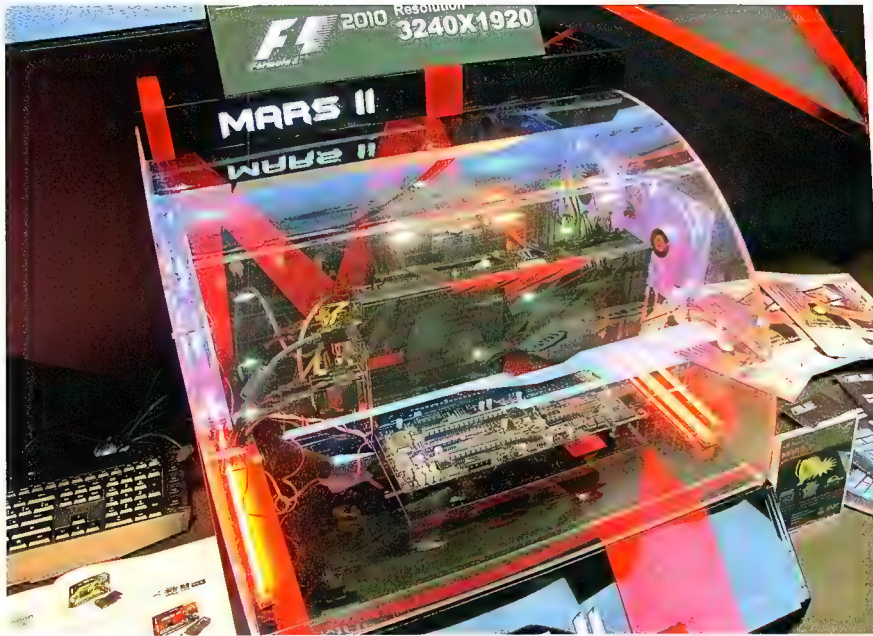
Motherboards

This meant that despite the best efforts of manufacturers, there were few products that we hadn't already discovered. There were plenty of Z68 motherboards, the most exciting of which is the soon to be released Z68-Gaming from Gigabyte, which is the first of the G1 line of gaming motherboards to use a non-X58 chipset. There were also a surprising number of boards using AMD's 990X chipset. This AM3+ chipset works with the current Phenom II X6 CPUs, but is designed for Zambezi, which rumours currently put at a late August launch under the FX branding.

Gigabyte and MSI were also showing off X79 motherboards using Intel's Socket 2011 for Sandy Bridge-E. While we doubt that this will even launch in 2011, the X79 is designed as a replacement for the aging X58 enthusiast platform. It features such temptations as quad channel DDR, PCI-Express 3.0 and support for Serial Attached SCSI. It is worth keeping in mind though that the X79 motherboards on show

were early validation models, and the shipping products will likely be a lot more feature rich (at the very least we expect more than four RAM slots on higher end boards).





VGA cards

ASUS showed off its eagerly anticipated MARS II dual GeForce GTX 580 graphics card. Unfortunately ASUS has this ridiculous habit of burying every interesting product under fingerprint-smudged Perspex. In the case of the demo system with the MARS II card it also ensured that the curve in the Perspex

reflected as many lights as possible, making our photograph less than impressive. Rest assured that this triple slot monster will take up a serious amount of space in your case.

Cases

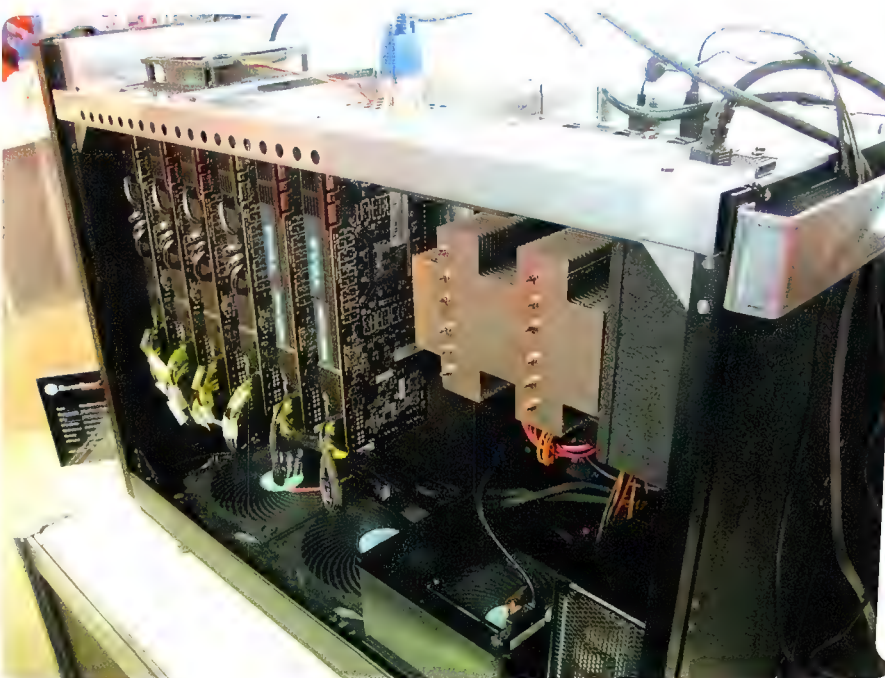
With such a dampener put on the traditional motherboard and graphics card part of Computex it was up to the other component



and peripheral makers to impress. Last year we saw them focus on power supplies and SSDs, but this year the big trend seemed to be cases and peripherals.

Of the many and varied cases we saw on show a few stood out. Old Atomic favorite Silverstone had a few select models to show off, including the Temjin TJ-12, which has space for six full length VGA cards inside its enormous chassis. But even more impressive was the decidedly different Micro ATX Temjin TJ08-E, in which the motherboard is mounted upside down, and large heatsinks are supported with a tiny, adjustable stand.

There was very little on show that could be considered new, thanks to the timing of this year's big tech launches.





Left: We aren't sure about the AMD branding, but we loved the rubber finish on this enforcer case; Above: InWin's excellent Mini-ITX offering.

Fractal Design was showing off a range of cases diversifying beyond the silent computing Niche that it currently occupies. The Arc is designed for high airflow, and keeps the same black with white highlight aesthetic as previous models but focuses on cooling. One other really

Corsair was showing off its drool-worthy white 600T case (page 43) but even more crucially it was finally giving us a look at Corsair Link. This is at heart a lighting and fan controller, but it can tie into various Corsair products to create a dynamic lighting system. For example, you can set the various lights to reflect the heat levels in the case, reading direct from temp sensors. Or you can tie your lighting to RAM loading. There is huge potential for some really creative case design using the Corsair Link system.

Corsair Link is at heart a lighting and fan controller, but can tie into various Corsair products to create a dynamic lighting system.

The other case that blew us away was a 'Colossal' new follow up to one of CoolerMaster's old models. Unfortunately we can't say which one due to CoolerMaster not wanting to announce it just yet, but we are pushing them for a sample. The case that did impress us though was the AMD edition of the Enforcer case that we recently reviewed. While we aren't sold on the scorpion or AMD logos (AMD is dubbing its Zambezi and 990X enthusiast platform 'Scorpius') we adored the matt, rubberized black finish, which is similar to that seen on BitFenix's Shinobi case.

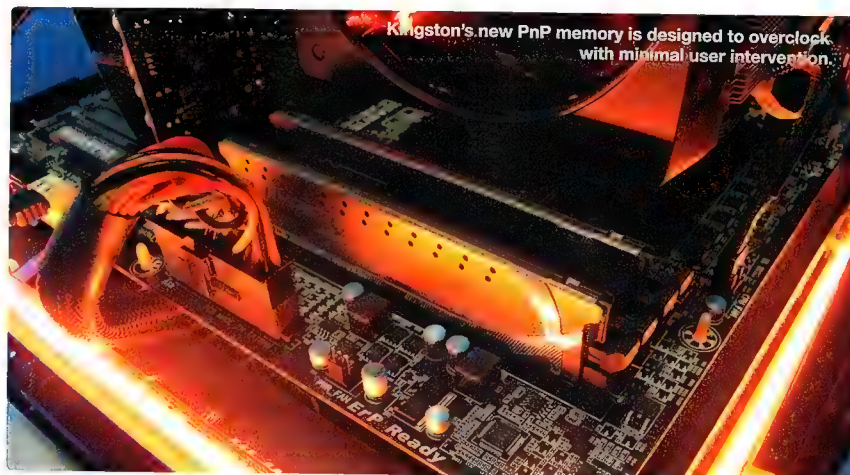
nifty thing Fractal Design is doing is releasing USB 3 front panel upgrade kits for its cases, which is great for those who bought into USB 3 hardware before front panels became standard.

RAM

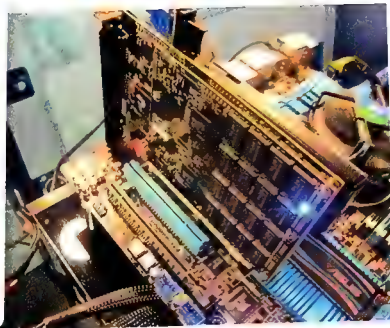
Corsair was also showing off low profile vengeance RAM – a response to the rising popularity of large CPU coolers and the tendency for them to not play nicely with big heatspreaders. What was missing was the anticipated move into peripherals, we expected to see a keyboard and mouse from Corsair but it



We spotted this hot award logo while wandering past GEIL's stand and just had to take a photo.



Kingston's new PnP memory is designed to overclock with minimal user intervention.



Left: This nifty box can capture console footage to its internal HDD; Middle: the RevoDrive3 in all its glory; Right: OCZ's pairing of RevoDrive and Hard Drive.

seems that they aren't yet ready for primetime.

Speaking of RAM, while there was little that could be considered mindblowing, we were impressed with Kingston's new line of PnP RAM, which will automatically overclock when added to a system. It takes the hassle out of RAM tweaking for those who are more concerned with getting in and gaming.

Peripherals

Antec didn't have a huge amount of new product on show, although it was our first chance to get a look at the Khuler H920 high end integrated water cooler. We did get a demo of the new Antec speakers, a major new push for the company, although it isn't clear whether the speaker product line will end up on shelves in Australia.

OCZ managed to keep the march of 2.5in SSDs fresh, with new PCI-Express models on show, including the RevoDrive 3 and RevoDrive

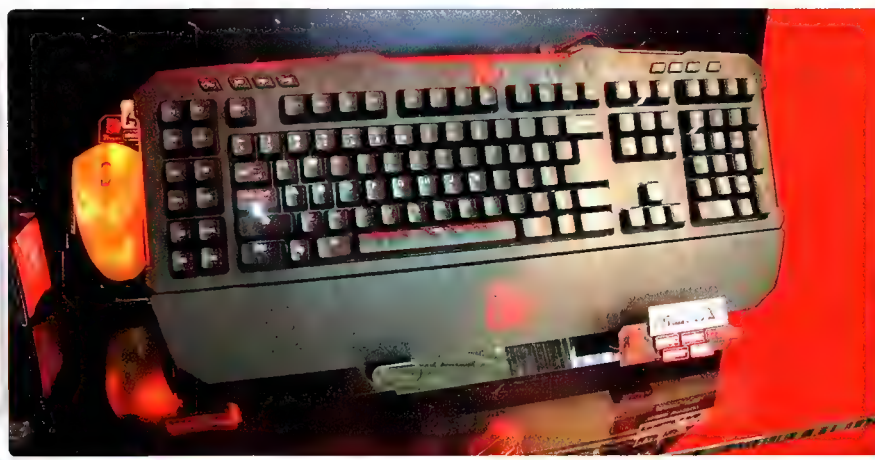
Hybrid (which has a hard drive onboard and uses the SSD as cache). Plenty of other manufacturers were finally showing off SATA 6Gbps models as well, but it often feels like OCZ is the only company trying to innovate in this space.

It is no secret that until recently we have been less than impressed with a lot of gaming peripherals coming out of Taiwan. However this year it was becoming quite apparent that the quality of products was improving at a rapid rate. Thermaltake's TT esports line has some very tasty mechanical keyboards on the way for example, including one that only has the WASD and a handful of other keys backlit.

But the peripheral that impressed the most came from the most unlikely of sources, memory manufacturer GELIL. After branching into power

supplies with its Thortech brand, it is now turning its attention to mousing, with an innovative dual optical/laser sensor solution marketed under the brand Epic Gear. Our brief time with the mouse had us hankering for more, and with Razor due to release a similar sensor solution soon we could have a very interesting battle for our hands.

In many ways it looks like business as usual for the rest of 2011. We may see Sandy Bridge-E by the end of the year, and we'll certainly see Zambezi, but without these big processor launches to wrap associating products around we expect things to be fairly quiet. **JG**



Above: GEIL's Epic Gear branded mouse impressed with dual optical and laser sensors; Upper Right: TT eSports' new mechanical keyboard with selective backlighting; Lower Right: CoolerMaster's entry into the gaming keyboard market.

ASUS SABERTOOTH 990FX

AMD joins the prowl.

Street Price TBC Supplier ASUS

Website www.asus.com.au/

Specifications Socket AM3+; 990FX chipset; ATX form factor; 4 x PCI-e x16 (2 x 16x, 2 x 8x electrically); 1 x PCI-e 1x; 1 x PCI; 2 x SATA2, 6 x SATA3; DDR3-2000(OC)

It's not often that you can purchase a motherboard equipped with a chipset/socket designed for a new CPU architecture well before the appropriate CPUs have been released. AM3+ is the latest socket type by AMD, which facilitates the extra pin required for Bulldozer processors to unleash their power on unsuspecting Intel diehards. The Sabertooth 990FX yields, as the name suggests, the brand spanking new enthusiast 990FX chipset.

So what does the 990FX have over the existing flagship 890FX? Well there's a nice bump in HyperTransport sample rate, from the existing 5.2 GT/s to 6.4GT/s (HT 3.0 vs HT 3.1), however this boost is only available to AM3+ processors. There's also the ability to run SLI (shock horror!) which is a welcome addition. Otherwise, this chipset is very much a re-branding of the existing 890FX, bar guaranteed compatibility with future processors. Those with older boards, you'll find comfort in knowing a BIOS update will more than likely allow you to run AM3+ CPUs, albeit without the perks of the 990FX chipset.

32 PCI-e 2.0 graphics lanes allow for two 16x GPUs to run in tandem, three at 16x/8x/8x, or

four at 8x. A further ten lanes (split into a single 4x and six 1x lanes) are used for other devices such as audio cards and USB 3.0 controllers.

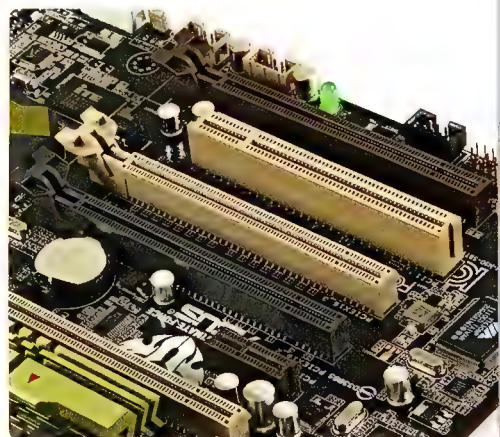
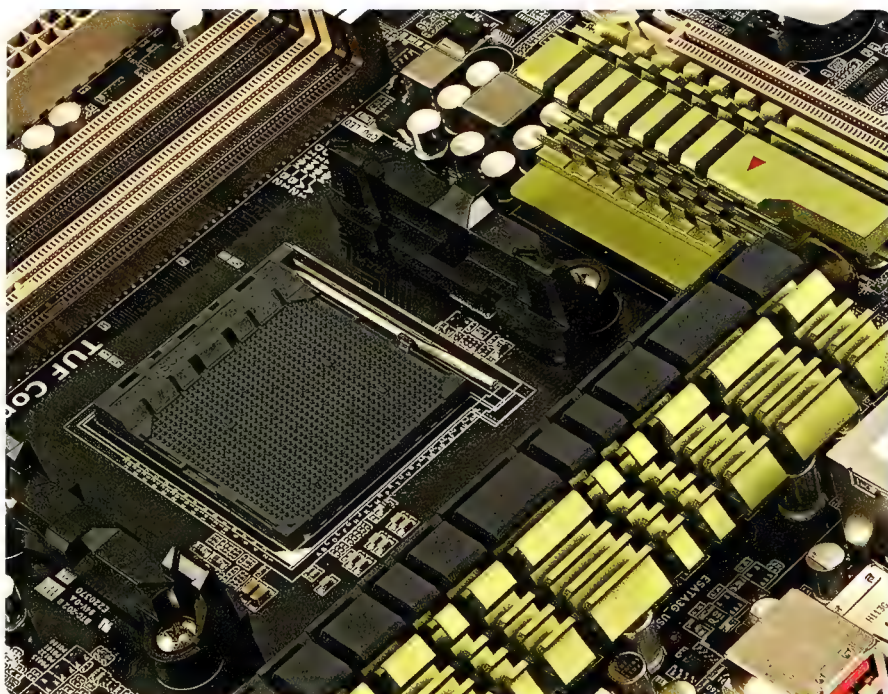
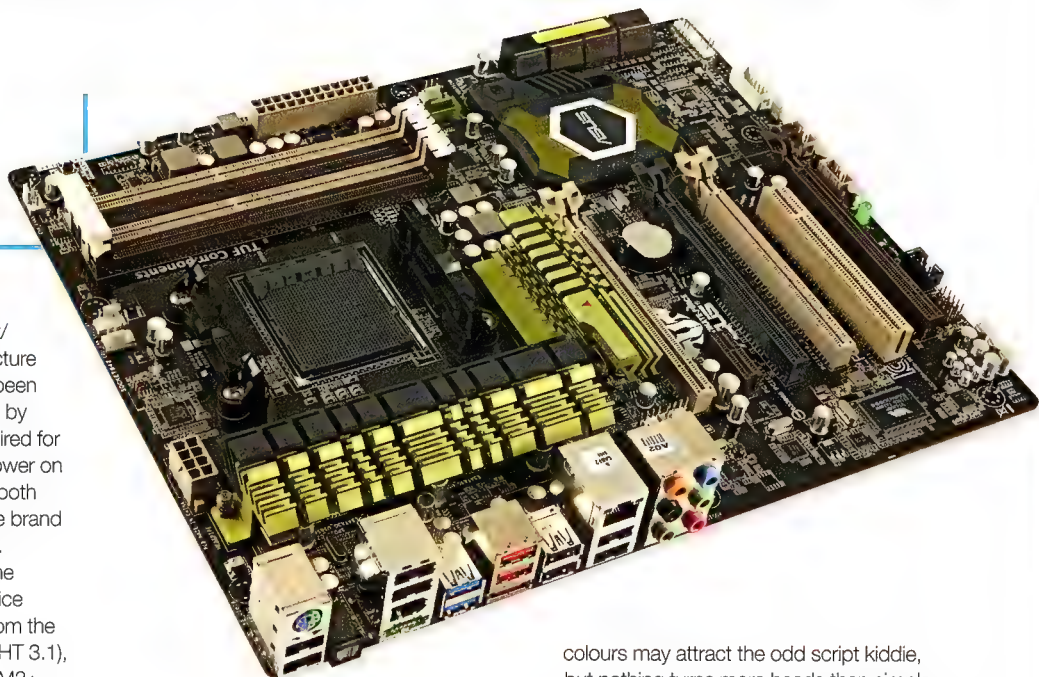
The new SB950 Southbridge is a mere name change from the existing SB850 chipset. No surprises there, it already offered native SATA 3.0 connectivity, although the lack of native USB 3.0 is a tad disappointing.

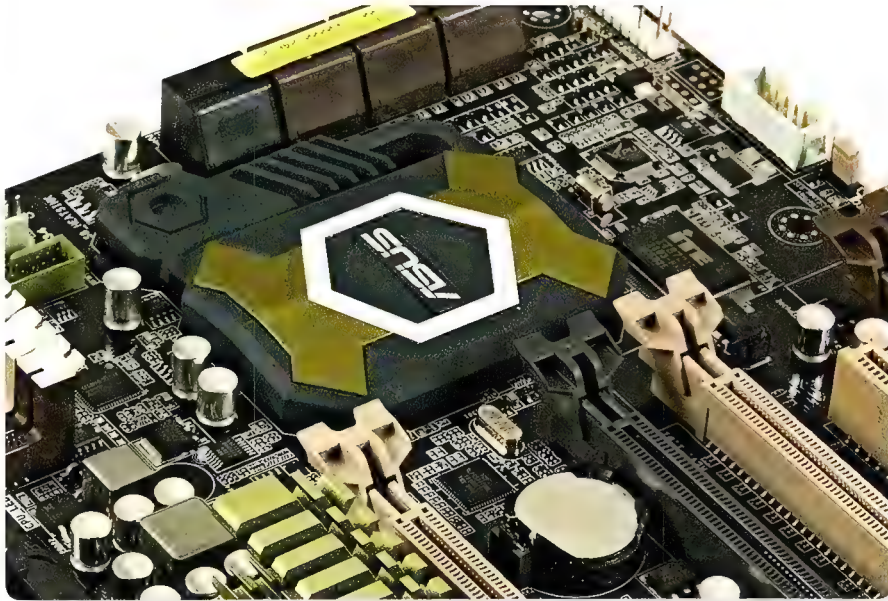
What we love about this board is its subtle military camo elegance. Flashy mismatched

colours may attract the odd script kiddie, but nothing turns more heads than simple beauty – and this board has just that. CeraMIX ceramic cooling technology is coated on parts of each heatsink, and claims to increase heat dissipation via enlarged area due to microscopic irregularity. Whether this has a tangible effect on temperatures remains to be seen, but it does have the effect of adding an interesting aesthetic element to the board.

Bundled with the Sabertooth is the usual SATA cables, a single 2-way SLI bridge, and the handy Q-Connectors. This wouldn't be a TUF series product without a 'Certificate of Reliability' enclosed, indicating thermal, shock and mechanical tests (to name a few) on key components.

A 8+2 phase DIGI+ VRM power design makes an appearance, offering clean power and fine controlled voltage increments of 0.005v. Five levels of Load Line Calibration facilitate overclocking by maintaining suitable load voltage levels.

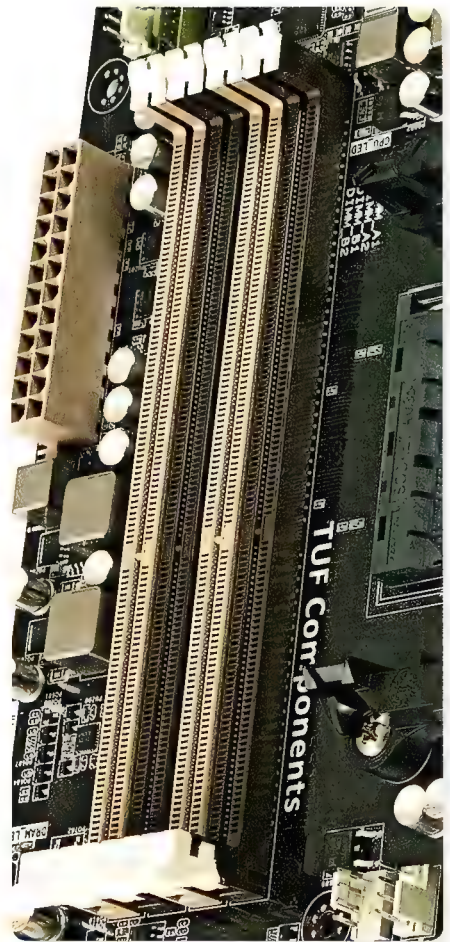




The TUF series is all about military design and standards. The alloy chokes, capacitor and MOSFETs are claimed to be of military standard. The 'Thermal Radar' technology has been brought over from the P67 Sabertooth, which consists of thermal probes in the vicinity of the CPU, DIMM slots, expansion slots and other key areas, all reported to the user via the Thermal Radar software. The board is intelligent enough to automatically adjust fans to keep these

us a clock frequency of 4.2GHz (200 x 21) with our Phenom II X4 980. Setting LLC to 'high' resulted in our 1.425v BIOS setting dropping to 1.404v idle, and 1.392v load. Some noticeable vDroop there. On the other hand, 'extreme' pushed our voltages up, from 1.38v in the BIOS to 1.404v load, and 1.38v idle.

Not to neglect our peripherals, connectivity on the I/O panel includes a PS/2 combo port, FireWire, two eSATA (one powered), two USB



Flashy mismatched colours may attract the odd script kiddie, but nothing turns more heads than simple beauty – and this board has just that.

various areas cool, unlike traditional designs which focus on the CPU only.

The absence of Thermal Armor doesn't concern us, we're not too sure it had a positive net affect on temperatures. But that doesn't mean this board isn't protected; an 'exclusive' ESD (electrostatic discharge) guard chip protects your kit from accidental zapping. Yes, we know you don't use an anti-static wrist strap!

Our overclocking attempt managed to score

3.0, ten USB 2.0, six audio jacks, optical S/PDIF out, and a Gigabit LAN port. Audio is powered by the Realtek ALC892 codec. It's nothing particularly special, but it does the job.

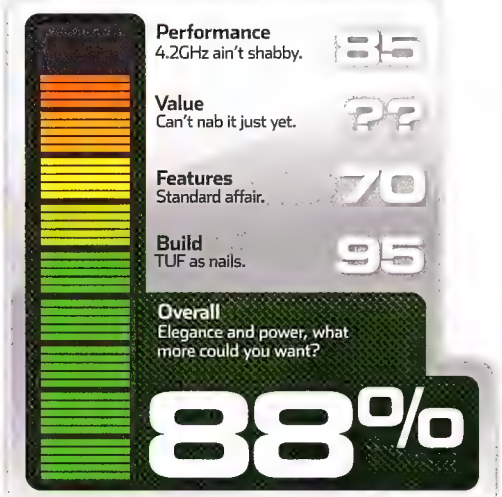
Similar to the Intel based Sabertooth motherboards, the AMD platform has progressed to the age of UEFI (Unified Extensible Firmware Interface). This means 3TB+ drive support, and a pretty UI when delving into the various setup settings. EZ Mode and Advanced

Mode UI options are available depending on skill level, but you'll almost always want to head straight to the latter – that's where all the fun is!

Overall we're impressed with this board. Unfortunately, while we wait for the new kit to arrive, the best processor we have is the X4 980. We're itching to try the upcoming Zambezi processors (that's eight cores of fun), and we're certain that this board can harness the power of the next generation without issue. Now, hurry up AMD! **VC**

ASUS Sabertooth 990FX

	Phenom II X4 980	20x200; DDR3-1600 8-8-8-24	20x210; DDR3-1680 8-8-8-24	20x210; DDR3- 1680 8-8-7-24
PIFast	27.8s		26.65s	26.65s
wPrime 32M - single thread	37.064s		34.134s	34.931s
wPrime 32M - multi-thread	9.907s (3.74x efficiency)		9.252s (3.69x)	9.483s (3.68x)
CineBench R10 64bit - single thread	4608		4829	4843
CineBench R10 64bit - multi-thread	16584 (3.6x efficiency)		17553 (3.6x)	17427 (3.6x)
Everest Read	9227MB/s		9677MB/s	9691MB/s
Everest Write	6857MB/s		7196MB/s	7175MB/s
Everest Latency	50.1ns		48ns	48.2ns



GIGABYTE GA-990FXA-UD7

The green team gets a taste of style.

Street Price \$270 Supplier GIGABYTE

Website www.gigabyte.com.au/

Specifications Socket AM3+; 990FX chipset; ATX form factor; 6 x PCI-e x16 (2 x 16x, 2 x 8x, 2 x 4x electrically); 1 x PCI; 8 x SATA3; DDR3-2000(OC)

If you recall our review of the GA-P67A-UD7 a few issues back, you'll remember how much we loved the new design direction that GIGABYTE took, and have continued to take since. The GA-990FXA-UD7 feels like the spiritual sibling of the P67 board, with a strikingly similar beauty and a penchant for performance. The ghastly blue and assorted pastel colour scheme is slowly being phased out of the product line, and we eagerly await the day that it's withdrawn completely.

Board layout is well thought out, with a low profile SouthBridge heatsink, and power connections close to the edges of the motherboard. Cable hiding enthusiasts need not worry! Our testing session was made easy by having power/reset and 'clr CMOS' buttons at the ready. The latter has a plastic cap to prevent accidental clickage, just in case you're a tad lazy and fumble for buttons blindly (or take the cap off for some nerdy Russian Roulette!) Troubleshooting an issue with the board is as simple as matching the onboard debug LED to the codes outlined in the manual.

A nifty inclusion is GIGABYTE's 'Turbo XHD' automatic RAID0 configuration utility. Connecting two HDDs to the motherboard will bring up an option on boot to create a RAID0 array. It's then just a matter of hitting 'Y' and letting the motherboard do its thing. Beats doing it manually!

When you see 'UD7' tacked onto the end of a GIGABYTE motherboard model name, you know you're getting a high end product. Not unlike the ASUS Sabertooth 990FX, this board utilises an 8 + 2 phase VRM setup to feed clean power into the CPU. Four DDR3 DIMMs supporting up to 32GB of memory in dual-channel configuration are at your disposal. Overclocking will allow memory up to 2000MHz

to be installed.

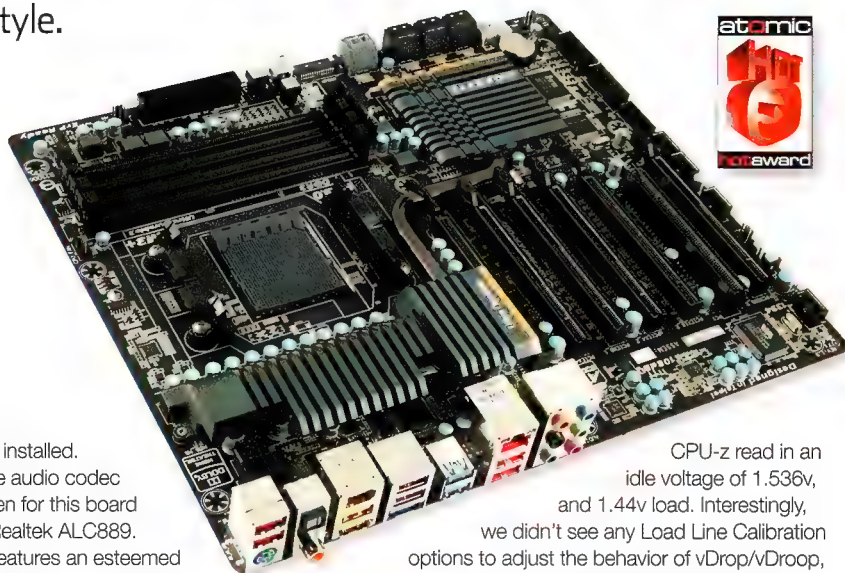
The audio codec chosen for this board is a Realtek ALC889. This features an esteemed 108dB signal-to-noise ratio DAC (Digital to Analogue Converter) and 104dB ADC (Analogue to Digital Converter), with support for 192kHz sampling rate. There's 10 DAC channels, eight for the ports on the rear, and two for stereo output on the front panel.

Dolby Home Theater technology is inbuilt, allowing emulated surround sound from two channel sources, or an increase from 5.1 to virtual 7.1 surround, in addition to other audio enhancements such as 'audio optimizer' to produce a flat frequency response.

The UD7 has a barebones bundle which features the obligatory SLI and CrossFire bridges to facilitate up to 4-way SLI/CrossFire, SATA cables, and a couple of small case stickers.

Connectivity is abundant, with eight USB 2.0 ports and two USB3.0 ports at the rear, a combined PS/2 port, FireWire, two eSATA (one 3Gb/s, the other 6Gb/s), a Gigabit LAN port, coaxial/optical S/PDIF out, and 6 audio jacks.

Overclocking the CPU was quite simple using the traditional Award BIOS. We set a voltage of 1.425 + 0.075v (1.5v) using CPU voltage control to attain 4.2GHz stable on our Phenom II X4 980.



CPU-z read in an idle voltage of 1.536v, and 1.44v load. Interestingly,

we didn't see any Load Line Calibration options to adjust the behavior of vDrop/vDroop, however we still managed a stable overclock.

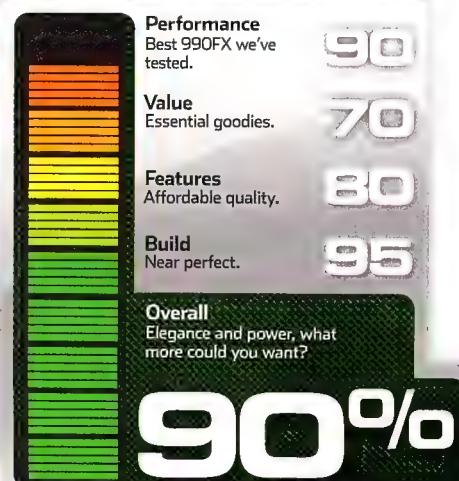
AMD's 990FX allocates 32 PCI-e 2.0 lanes to graphics, thus there's plenty of bandwidth for multi-card configurations. 16x/16x for dual cards, 16x/8x/8x for triple, and 8x/8x/8x/8x for quad.

This motherboard sits above the Sabertooth 990FX on the food chain, as it were. Our results agree with this, with the 990FXA-UD7 edging ahead in most tests. That being said, the difference isn't substantial. While this board performs above its competition, the real draws here are the extras such as the additional PCI-e slots, cutting edge design, and reasonable price. Reflecting back, it's actually quite amazing how such advanced componentry and design has become increasingly affordable and reliable over the years.

Although we're some time from getting our eager hands on Bulldozer parts, there is a market for this board. Namely, those who own AM3 CPUs and are looking to future proof their upgrade path. **VC**

GIGABYTE GA-990FXA-UD7

	Phenom II X4 980	20x200; DDR3-1680 9-9-9-24	20x210; DDR3-1680 9-9-9-24	20x210; DDR3-1680 8-8-7-24
PiFast	27.77s	26.63s	26.36s	
wPrime 32M - single thread	36.08s	34.665s	34.384s	
wPrime 32M - multi-thread	9.564s (3.77x efficiency)	9.126s (3.8x)	9.124s (3.77x)	
CineBench R10 64bit - single thread	4607	4816	4830	
CineBench R10 64bit - multi-thread	16838 (3.55x efficiency)	17325 (3.6x)	17682 (3.66x)	
Everest Read	9064MB/s	9336MB/s	9525MB/s	
Everest Write	6982MB/s	7192MB/s	7195MB/s	
Everest Latency	50.3ns	47.8s	46.4ns	



MSI Z68A-GD80 B3

Catching some Zs with MSI.

Street Price \$275 Supplier MSI

Website <http://au.msi.com/>

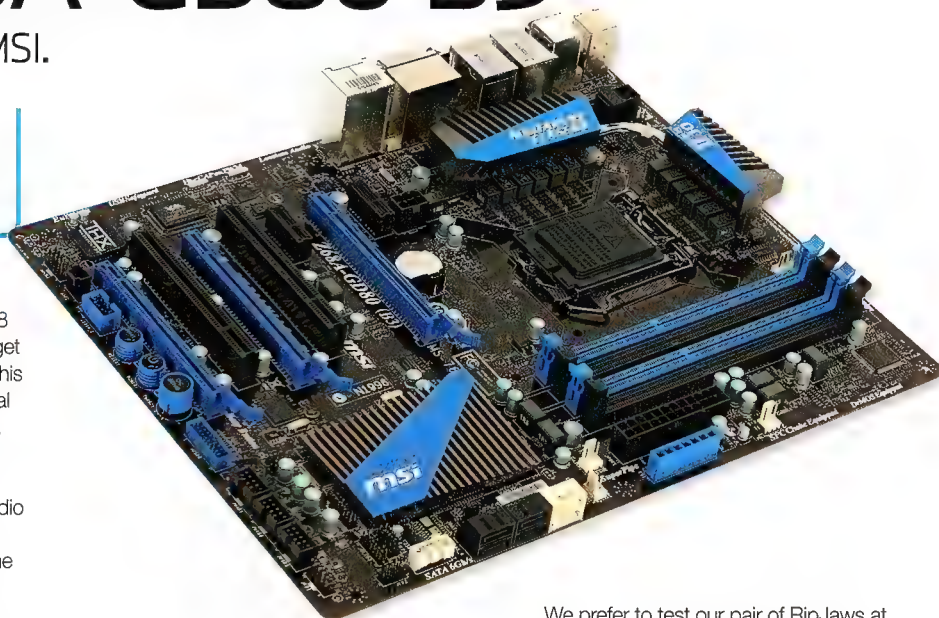
Specifications Socket 1155; Z68 chipset; ATX form factor; 3 x PCI-e x16 (1 x 16x, 1 x 8x, 1 x 4x electrically); 2 x PCI-e 1x; 2 x PCI; 4 x SATA2, 3 x SATA3; DDR3-2133(OC)

It's full steam ahead with the new Intel Z68 chipset, and no manufacturer wants to be left behind. MSI has sent us its new Z68 based board, the Z68A-GD80-B3, for us to get our eager thermal-paste-stained hands on. This particular motherboard is aimed at the general enthusiast, unlike the beefier Big Bang range.

Feature wise, MSI has provided their OC Genie II technology, in addition to its UEFI implementation 'ClickBIOS', and THX TruStudio PRO audio solution. Before settling into our own overclock session, we had a play with the OC Genie II button toggle switch. The results are decent; it achieved 4.2GHz from stock 3.4GHz, with 1.35v vCore with the 2600K. One must remember that this clock rate is actually quite trivial to do manually, so we wouldn't be surprised if the settings are hard-coded based on the CPU's model name.

ClickBIOS vaguely resembles ASUS's style of setup, with a basic front page which leads into detailed settings. On the top right hand corner the CPU clock rate is displayed, in addition to its temperature. We noticed that the temperature readout was quite inaccurate, often overstating the true value. Modifying settings is straightforward, but a little clunky. You can't key in most values, you need to select them from a list using the mouse or by repeatedly hitting the arrow keys. The entire UI felt like it was constantly refreshing, judging by the distracting and incessant flashing of the screen – but perhaps we're being a little pedantic.

Visually, the motherboard has a retro Gigabyte vibe to it – blue heatsinks, DIMM and PCI-e slots. There's plenty of space around the CPU socket too, however you may need to use low profile memory for larger coolers.



Six USB ports, four USB 2.0 and two USB 3.0, adorn the I/O panel, in addition to a single FireWire and two Gigabit LAN ports. A DVI-D and HDMI port are provided for those using CPUs with an internal GPU core. Benchmarkers will rejoice knowing that there's power and reboot buttons onboard, with clear CMOS on the I/O panel.

MSI isn't shy when it comes to bundling kit. The Z68A-GD80 is equipped with a USB3.0 bracket for adding two additional external ports, an SLI ribbon bridge, V-Check leads, and M-Connectors.

A crack of the knuckles marked the initiation of benchmarking, and with ClickBIOS at the ready we got down to business. The motherboard has two LLC settings, basically on or off. We opted to turn it on, and set the voltage to 1.45v. We were fortunate to have this Prime95 stable, however lower voltages were not so successful. We did notice that LLC raised the voltage quite significantly, to about 1.5v under load according to CPU-Z.

We prefer to test our pair of RipJaws at 2133MHz, but we were saddened to find that this board really didn't like us doing that. The dreaded constant reboots made it loud and clear that we'd have to try lowering latencies instead. We manage to get from the stock 9-9-9-24 to 8-9-8-24 at 1866MHz, which is quite respectable. Higher frequencies tend to perform better though, and as you can see in the table, the performance increase isn't substantial.

Overall, the board performs quite well. In fact, it's often difficult to judge a board based on overclocking performance, because from low to high end, they're all quite excellent! So we have to nitpick, weeding out the best of the best from an array of boards. When compared to the Z68X-UD3H, it's clear that the MSI offering can't quite match it in terms of raw figures. The 2133MHz memory speed really does make the difference, we're just stumped as to why the board refused to let us play. **VC**

MSI Z68A-GD80 B3

Intel 2600K	50 x 100; 1866MHz 9-9-9-24	40 x 100; 1866 9-9-9-24	50 x 100; 1866MHz 8-9-8-24
PiFast	14.8s	18.47s	14.79s
wPrime 32M - single thread	27.973s	35.005s	28.018s
wPrime 32M - multi-thread (HT on)	5.163s (5.42x efficiency)	6.427s (5.45x)	5.18s (5.41x)
CineBench R10 64bit - single thread	8346	6683	8385
CineBench R10 64bit - multi-thread	32699 (3.92x efficiency)	26369 (3.95x)	33489 (3.99x)
Everest Read	22554MB/s	21483MB/s	23049MB/s
Everest Write	24792MB/s	20565MB/s	24786MB/s
Everest Latency	40.3ns	41.3ns	38.1ns

Performance
Struggles with memory OC.

80

Value
Good point for what you're getting.

82

Features
Great bundle.

85

Build
Does the job.

75

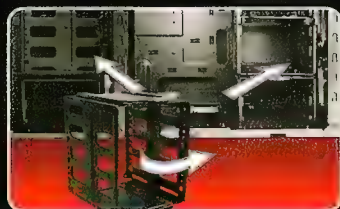
Overall
If priced right, a potentially solid choice.

83%



ENFORCER

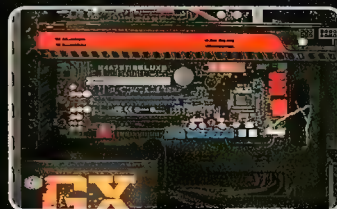
A New Reign of Revolution



Removable & Rotatable HDD cage
for convenient installation



Reinforced front door
protects your vital devices
Support for USB3.0 (internal)



Support high-end graphics cards
including ATI Radeon HD 6990
and NVIDIA GeForce GTX 590



CMSTORM.COM

Premium Resellers

VIC Computers & Parts Land 03 8542 8688 cpl.net.au
Centre Com 1300 007 600 centrecom.com.au
MSY Technology Pty. Ltd. 03 9560 2288 msy.com.au
Scorpion Technology 1300 726 770 scorpTec.com.au
PC Case Gear 03 9551 0889 pccasegear.com.au

NSW PCDIY 02 9648 1001 pcdiy.com.au
ARC Computer 02 9748 8322 arc.com.au
Aus PC Market 02 9646 8088 auspcmarket.com.au
Capitol Computer 02 9281 8890 capitolcomputer.com.au
Tech Buy 02 9648 1818 techbuy.com.au
MSY Technology 02 9648 4116 msy.com.au
SA PCDIY 08 8410 0446 adrenalin.net.au
Allneeds Computers 08 8221 8661 allneeds.com.au

QLD Computer Alliance 07 3421 3200 computeralliance.com.au
Game Dude Computers 07 3387 1500 gamedude.com.au
MSY Technology 07 3217 9070 msy.com.au
Umart Online 07 3369 3928 umart.com.au
WA Austin Computers 08 9201 2788 austin.net.au/index.asp
MSY Technology 08 9344 1002 msy.com.au
Netplus Micro Computers 08 9242 7288 netplus.com.au

Razer Onza Tournament Edition

An adjustable option for Xbox gamers that's hard to hate.

Street Price \$55 **Supplier** Razer
Website www.razerzone.com

Specifications 2x programmable buttons; adjustable thumb-stick resistance; precision D-pad; 15ft cord.

We first picked up – and more or less fell for – the Onza Tournament Edition Xbox controller last year, at Gamescomm in Germany. It was love at first site.

Now, after a long separation, we are together again... but feelings seem to have changed. Maybe it's us, maybe it's the controller; who can say in these strange, long-distance relationships. Maybe it's the harsh reality of casual flirting compared to actual hardcore gaming together. Regardless, we have to work at our love now – it's no longer something that can be taken for granted.

On paper, everything's great about the controller. Two programmable buttons that sit with the shoulder buttons? Yes please, we can at last make meeling in Halo a lot easier, at least with our small hands. Adjustable thumb-sticks, thanks to a very clever dial that stiffens the sticks' resistance? Awesome, and this is one part of the Onza (note: only the Tournament Edition features this functionality) that does stand up to that first

flush of excitement. Huge cord, that also features a quick release for those time clumsy flatmates/pets/stoners walk into the cable? About time.

Like we said – there's still a lot of affection for the Onza. But, also, there's an understanding that love on paper and in the real world are two different things, and the harsh reality of actual use has dimmed our appreciation somewhat. It sits wonderfully on the hand, the long cord is awesome, and the programmable buttons are the biz. But... man, for some reason, Razer's chosen to make the thumbsticks out of the slipperiest material known to gaming humanity.

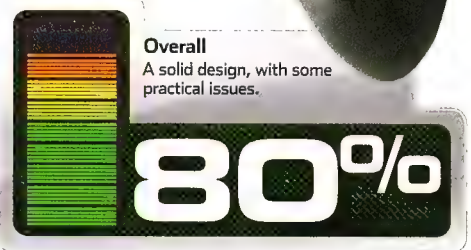
Maybe we sweat a lot. Maybe we exude some kind of greasy man-dew. Regardless, we found our thumbs slipping all over the place, making driving, fighting, walking or just about anything to do with camera movement or locomotion under stress an extreme chore, especially in action games. You can get around it with careful thumb positioning, but it's going to take a lot of effort and swearing. The adjustable tension, though, is fantastic.

It leaves the Onza in a hard spot. We had issues with it, but we still love it, and we just know that there are those out there who are not made of some friction-free material like us. It's worth buying, in our judgement, but it's also



worth testing out beforehand.

Just in case. **DH**



GIGABYTE Aivia gaming mouse

A solid effort for gamers, but let down by a few shoddy details.

Street Price TBC **Supplier** GIGABYTE
Website www.gigabyte.com

Specifications 100-5600dpi, hardware, up to 6500dpi; 32KB memory; 1.8m USB cable; charging dock/base station; 2x lithium ion battery packs.

You know, no one's still managed to release a hybrid wireless gaming mouse that's as elegant as Microsoft's Sidewinder. Everything since then that tries to combine wireless ease of use with a back-up wired solution has made the cardinal mistake – it's simply too complex to switch from wireless to wired in the middle of a game. GIGABYTE's latest mousing offering, the Aivia (to tie in with its Aivia keyboards) makes that error, and few more, turning what is otherwise a solid offering into more rat than mouse.

To look at it, the Aivia mouse is a striking beast, with similarities to Silverstone's Raven range. If you like stealth bomber aesthetics, this is a good thing! The combination of hard edges and sweeping curves certainly lends the design a certain sleekness, and the combo of smooth upper surface and cheaply textured (though effective) side-panels certainly aids grip.

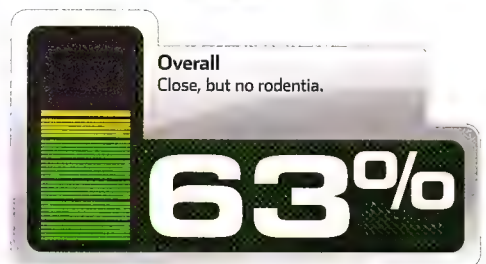
However, under the hand, especially if you rest your palm on the mouse as opposed to holding the mouse in a claw grip, there's a point

of irritation, a join between two panels that digs into your palm. It's irritating in the short term, and actually painful in the longterm.

This is the join between the mouse itself and the housing for the one of two LiIon batteries included with it. You can keep a spare battery charged at all times, and swap it in like you would a fresh mag for firearm. That, at least, we really like.

The charging base-station for the mouse is also the wireless station, and this can also be fitted with a cable to attach to the mouse when you're in between batteries, but it's a chore to click the cable in and out, especially compared to Microsoft's excellent magnetic solution. Taking time to either swap batteries or attach a cable on the middle of a harsh death match can be the difference between life, and, well, death.

The rest of the mouse – the included Ghost macro software, its in-game performance and button placement (and yes, it's good for lefties too!) – is all pretty good, but the flaws leave it a long way behind the pack, at least for our mousing style. If you're a claw-er rather than a gripper, if you think you can stay on top of keeping the mouse charged, it's a good option, but we still think there are better mice on the market. **DH**



Razer Chimaera wireless headset

A good looking, but heavy effort from edgy peripheral maker.

Street Price \$210 **Supplier** Razer
Website www.razerzone.com

Specifications Circumaural Design with 50mm Driver Units; 3x Preset EQ; Detachable 2.5mm Microphone Cable; Radio Frequency: 5.8GHz; Frequency Response: 20-20,000 Hz; Impedance: 320 at 1kHz; Drivers: 50 mm, with Neodymium Magnets.

There are few companies that produce cans quite as giant as Razer's. The well-regarded, but often critically-suspect peripherals maker often favours size and features over style and comfort, with sound quality usually mixed in there somewhere. Thankfully, the new 5.1 Chimaera wireless headset for Xbox 360, delivers some pretty punchy sound that should please the most demanding of gamers.

However... wow. They are big!

Oddly, though, they are comfortable, with enough padding to sit well on pretty much any noggin. And, without the added electronics that plagued and weighted down Razer's Starcraft-themed headset, the Chimaeras don't flop about your head should you move it around suddenly.

Your partner, however, will make merciless fun of you for wearing such a comedically large set of 'phones. You have been warned.

The set-up and syncing of the kit is simple, and soon enough you'll be hearing great, bass-rich sound without a mess of cables tracing back to your AV gear. Voice comes across well, though that is an admittedly mixed blessing. If you're chatting with mates, all well and good, but for the most part we don't need great clarity to be told what a camping fag we are. Thankfully, just swinging the mic up out of the way mutes it automatically. Speaking of mates, if you indulge in Xbox LAN days, up to four of these sets can be combined for good squad-based comms – which is a nice touch.

The 5.1 Dolby, though, is neither here nor there, really. We're not huge believers in in-cup 5.1 as it is, but there's no denying the crispness of the sound delivery. Your own mileage may vary, however, so if you're willing to foot the extra \$50 over the 2.1 Chimaeras, more power to you.

The batteries in the headset are rated for up to eight hours, though we rarely had them last that long. Seven seems more usual, and a three hour charge time might make truly huge gaming sessions a hassle. Take it as an excuse to leave the house for a bit, or maybe feed your pets. Otherwise, these are a solid – if large – option for the dedicated Xbox gamer. **DH**



Fanatec GT2 wheel and Clubsport pedals

Crossing the line in style.

Street Price \$799 **Supplier** Anyware
Website www.fanatec.de

Specifications Wheel: 10 buttons plus D-pad, aluminium gear paddles, H-pattern and sequential gear shifters. Clubsport pedals: All aluminium, load cell brake, FF motor on brake pedal, USB connection.

This is the high-end of the wheel and pedal set world. Made in Germany by Fanatec, they're also a bit rare – the company only producing relatively small numbers each year and there's usually a waiting list to get them. Aussie distributor Pagnian Imports (www.pagnianimports.com.au) has limited stock at the time of writing.

The wheel is modelled on the Porsche GT2 wheel and is \$449 standalone. It's PC, Xbox and PS3 compatible. It ticks every box and then some. The wheel is quite large at 300mm diameter and the rim thicker than you're probably used to. It feels like serious quality to hold, with a lovely soft Alcantara covering. Inside there are 3 force feedback motors, with a main and very powerful motor for forces plus two smaller motors for effects. They're connected to the shaft by belts, not cogs, and the overall effect is super smooth without the ratchety feel of other wheels.

A range of FF effects can be adjusted, and at max force the wheel takes some muscle to

move around, even then it's still wonderfully smooth. You can even adjust the FF settings in-game using the LED display and buttons.

10 backlit illuminated buttons are on the face of the wheel, and there's a D-pad too on the lower spoke. The desk clamp isn't the best and violent wrenching can have it detach itself, though there are permanent mounting screw holes in the base.

Down below the Clubsport pedals are exquisitely crafted wonders. Available separately for \$349, they connect directly via USB so are therefore compatible with Logitech G25/27 wheels, and are a worthwhile upgrade if you have one of those. All aluminium and with big pedals they're beautiful and effective. Really precise control is possible and the brake uses a load cell instead of a potentiometer, so braking is dependent on how hard you push, not how far. There's even a force feedback motor on the brake pedal that helps you know when the tires are locking up.



There's also a wireless dongle also sold separately which is lag-free and very handy for console installations. If you have the cash, these are simply the best. **BM**



Corsair SE 600T

We're a sucker for a good special edition case, and this mighty-whitey is no exception.

Street Price TBC Supplier Altech
Website <http://www.corsair.com>

Specifications 507 x 592 x 265mm; 4x 5.25in drives bays, 6x 3.5/2.5in drive bays; 8x expansion slots; 1x 200mm fan (front), 1x 200mm fan (top), 1x 120mm fan (rear); 4x USB2, 1x USB3, 1x IEEE1394, 1x mic, 1x headphone; ATX, mATX; steel and plastic construction.

There is an awful lot to like about Corsair's new Graphite range, but the thing we arguably like the most is its Special Edition 600T. While the main range is, oddly enough, coloured a very cool graphite, the Special Edition eschews the classic dark look for something altogether more striking, not to mention harder to make look good on a white page...

When we saw this case at Computex, it was nicknamed by Corsair and admirers alike the Stormtrooper case, and it's easy to see why – the stark white with black trim is remarkably similar to the white carapace and black undersuit of the Empire's elite bully boys. So, for Star Wars fans, this case is already looking like a solid build option. But there are solid practical reasons to get it too.

The 600T design is a roomy medium-sized build. The front fascia is all mesh inserts, except where you'll be installing ODDs or front-panel controls. On the leading edge are all the usual IO and control suspects, as well as a large fan control knob (with a very smooth action), and a single USB3 drive. Given that most USB3 enabled boards sport two headers, this seems odd, but we're guessing it's a price-point compromise.

The side panel is very interesting. Not only does the case come with an optional mesh insert

if you want to swap out the window in favour of greater airflow (the mesh is black, by the way, and looks tops), but the panel is also secured using a tool-less dual-catch mechanism. Just pop the catches and the panel drops down and away. It makes getting to your PC's innards very simple, while still being quite secure. That said, it might not make this the best option for a LAN-gaming build.

The rear is pretty much as you'd expect, with expansion-brackets cut for increased airflow, and two water-cooling inputs. The top panel features a pop-out mesh insert, making access to the top-mounted 200mm fan a literal breeze.

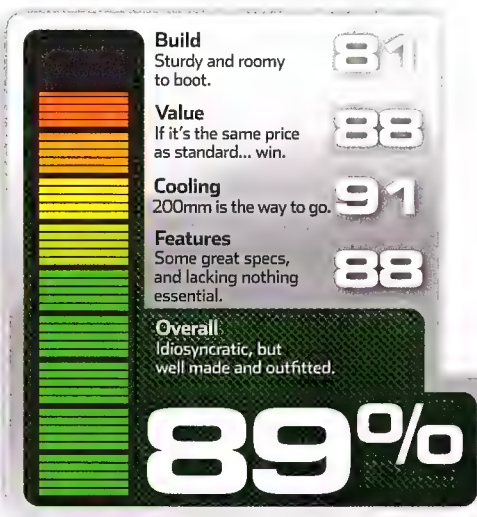
Internally, the case is just as neat and striking. In here it's all black metallic, and it's surprisingly roomy. There's a good selection of cable runs, and a mess of room between the motherboard plate and the other side-panel to tuck extra lengths of PSU cable. Speaking of the PSU, there's a neat little removable bracket for shorter PSUs, as we as a mesh intake underneath this mount.

The drive bays are of the tool-less variety, and this is about our only gripe with the 600T. The



pinch-to-remove brackets that hold your HDDs are fine, but the ODD bays feature a toggling switch system that seems designed to eventually break. Sure, one does not remove these drives that often, but why aren't old fashioned screws good enough? If we were building into this case we'd probably ditch this arrangement in favour of screws right away. Cooling options, on the other hand, are pretty generous, with two 200mm fans and a single 120mm fan in the rear.

All up, we wouldn't normally consider a white case, but the 600T has us re-thinking that position. **DH**



ENGINEERED FOR GAMING™



TURTLE BEACH

ENGINEERED FOR
XBOX 360



EAR FORCE®
XBOX LIVE® Chat plus
Wireless Digital RF Game Audio with
Dolby® Headphone 7.1 Surround Sound
X41

The Earforce® X41 is our top of the line XBOX 360® headset featuring 7.1 channel Dolby® surround sound, XBOX LIVE® chat and a digital RF wireless connection for crystal clear game audio. Combining outstanding comfort with a stunning 360 degree sound field and enhanced online communication, the X41 puts you in the middle of the action so you'll enjoy a gaming experience that's second to none.

ENGINEERED FOR
PS3



EAR FORCE®
PX5

The Ear Force PX5 is a new breed of wireless gaming headset. Enhance and personalize the entire gaming audio experience with fully customizable game, chat and microphone audio.

Communicate wirelessly with your PS3™, answer mobile phone calls and stream music using Bluetooth technology – all while gaming in Dolby 7.1 Surround Sound. The PX5 is the “secret weapon” for serious gamers seeking unmatched audio quality.

Other Headsets Available

EAR FORCE®
XBOX LIVE® Chat
with Amplified
Stereo Game Sound
X11



EAR FORCE®
XBOX LIVE® Chat plus
Wireless Digital RF
Stereo Game Audio
X31



EAR FORCE®
PX21



EAR FORCE®
P11



EAR FORCE®
Professional-Grade
PC Gaming Headset
Z1



EAR FORCE®
Professional-Grade
PC Gaming Headset
Z2



www.turtlebeachheadsets.com.au

Distributed By:
QMS
Interactive Entertainment Specialists

Selected items at selected retailers...

dickssmith
Sally's PC Software

GAMES

GAME

Gameltraders

Harvey Norman

JB Hi-Fi

NZ Enquiries

fiveeight

www.fiveeight.co.nz

MSI GT680-055AU

A laptop fit for Jocelyn Wildenstein.

Street Price \$2300 Supplier MSI
Website www.msi.com

Specifications Intel Core i7 2630QM (2-2.9GHz, 6MB); 4 x 4GB DDR3 1333MHz; 750GB HDD, 128GB Intel SSD; Blu-Ray drive; Nvidia GeForce GTX 460M; 15.6" LCD (1920x1200); 802.11b/g/n; Windows 7 Pro x64; mouse and cleaning cloth

As laptops become increasingly stagnant, and tablets infiltrate consumers' headspace, the need for laptop manufacturers to produce quality, attractive machines is paramount. It's often difficult to balance the trade-offs in laptop design. Powerful means large and heavy, with battery life barely sufficient to last a domestic flight. On the other hand, portability leads to increased price and a lack of grunt. MSI takes the former route, offering a big, heavy yet powerful solution.

When you meet a GT680 in person, the first thing you notice is the style. Or, lack thereof. Glossy plastics, especially those laced with tiny metallic flakes, are absolutely and positively unappealing. Strips of clear plastic line the edges of the notebook, backed by red lights which offer no purpose but to distract the user from the bulky build. Fortunately, they can be turned off.

A tessellated hexagonal pattern surrounds the keyboard, enhancing the overall tackiness. But one cannot claim to be observant without mentioning the fake chrome plastic hinges, and the protruding air-intake styled lid which not only adds to the overall thickness of the laptop, but makes it feel more flimsy than it actually is.

It would seem that some people are willing to trade in their sense of style for pure n00b-shattering grunt. A Sandy Bridge Core i7 2630QM powers the system, providing four cores of mobile power at a maximum of 2.9GHz per core, with HyperThreading capability. This processor has an Intel HD Graphic 3000 GPU on-die, but who'd want to invest in a hefty system without getting some real graphics horsepower in return? The DX11 capable GTX 460M fills this gap, and while it's not the most powerful solution, it's definitely no slouch.

Solid state drives are still a bit of a luxury, but when performance is a concern one would be crazy to exclude one. In addition to a 750GB 7200RPM mechanical disc, an Intel 120GB SSD is bundled to ensure optimum responsiveness.

Connectivity on the GT680 consists of a single Gigabit LAN, HDMI 1.4, eSATA and D-Sub ports, on the rear of the chassis. Two of each USB 2.0 and USB 3.0 ports are located on either side, including a SDHC/MMC card reader and four audio jacks for up to 7.1 channels of output.

Notebook speakers rarely offer sound quality above tinny highs and flat lows, which is why we're notably happy with the DynAudio solution employed by MSI. Tweeters on either side of the keyboard take care of the mids and highs, while a single sub beneath the unit adds a touch of base. There's slight clipping when the volume is set to maximum, and the quality isn't as good as most standalone speaker units, but the output is a definitely a step above typical inbuilt audio.

The full sized chiclet keyboard is responsive and comfortable to use, however we're surprised that with all the lights on this unit, that the keyboard itself isn't backlit. The trackpad is nice and large, but has no support for multi-touch gestures, isn't particularly responsive, and has frustratingly clumsy scrolling by way of tapping the top and bottom corners on the right hand side.

Screen quality is mediocre. Diverging from the surface normal of the panel quickly degenerates saturation. It's also glossy, which may deter some users. The HD resolution is very welcome, and games look brilliant with the resultant high DPI.

Bundled with the notebook is an MSI branded 3200DPI optical mouse. It feels really cheap in the hand, and the sound of pressing one of



the two thumb push-buttons echos inside the casing. On the bright side, it's really light, which some gamers may appreciate.

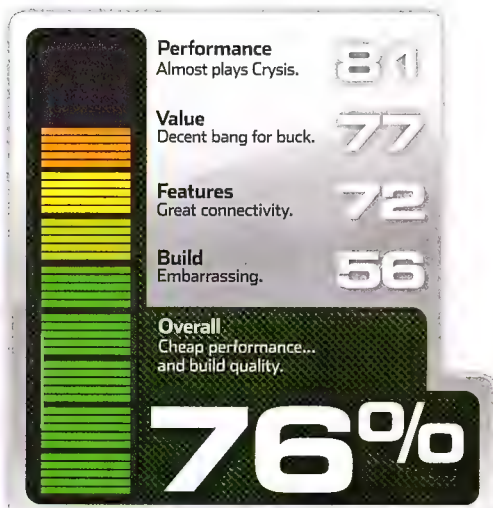
Capacitive touch buttons lie across the top of the keyboard to enable various features such as Turbo mode (only works when plugged into mains), Eco mode, and the ability to turn the hideous lights off. A 720p webcam above the screen completes the package.

Nice cells are required to power this monster, with a massive power brick to prove it. We ran OCCT power supply test (a mix of OCCT GPU and Linpack tests) to see how the battery would fair. We managed a mere 57m before it promptly died. Naturally, the battery life will be better under typical usage, but don't expect it to last while gaming.

For what you get, the price point is well suited. You get cheap performance, but no further thrills, bar decent speakers. **VC**

MSI GT680-055AU

	Non-Turbo	Turbo
Crysis (min/avg/max)	12.39/16.16/18.79 FPS	12.59/16.77/19.44 FPS
Lost Planet 2	17 FPS	17.2 FPS
3DMark 11	P1801/X588	P1872/X607
Unigine Heaven (Normal Tess.)	314/12.5FPS	320/12.7FPS
Unigine Heaven (No Tess.)	418/16.6FPS	439/17.4FPS
CineBench R10 64bit - single thread	4595	4528
CineBench R10 64bit - multi-thread	16694 (3.63x efficiency)	16976 (3.63x efficiency)

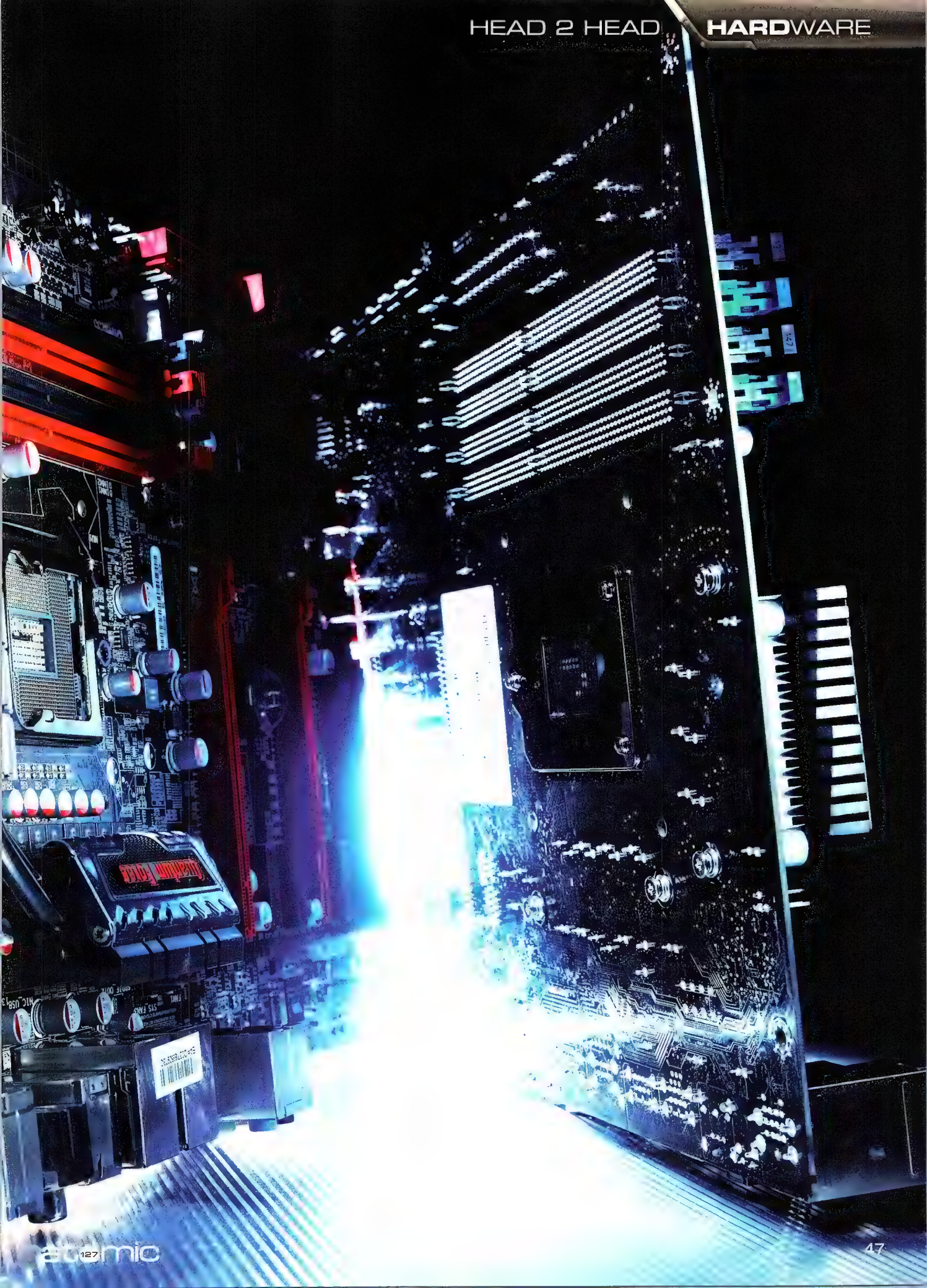


Back to the (Intel) BOARDS

A motherboard is the heart and soul of any PC – we test five of Intel's latest to find the best for you.

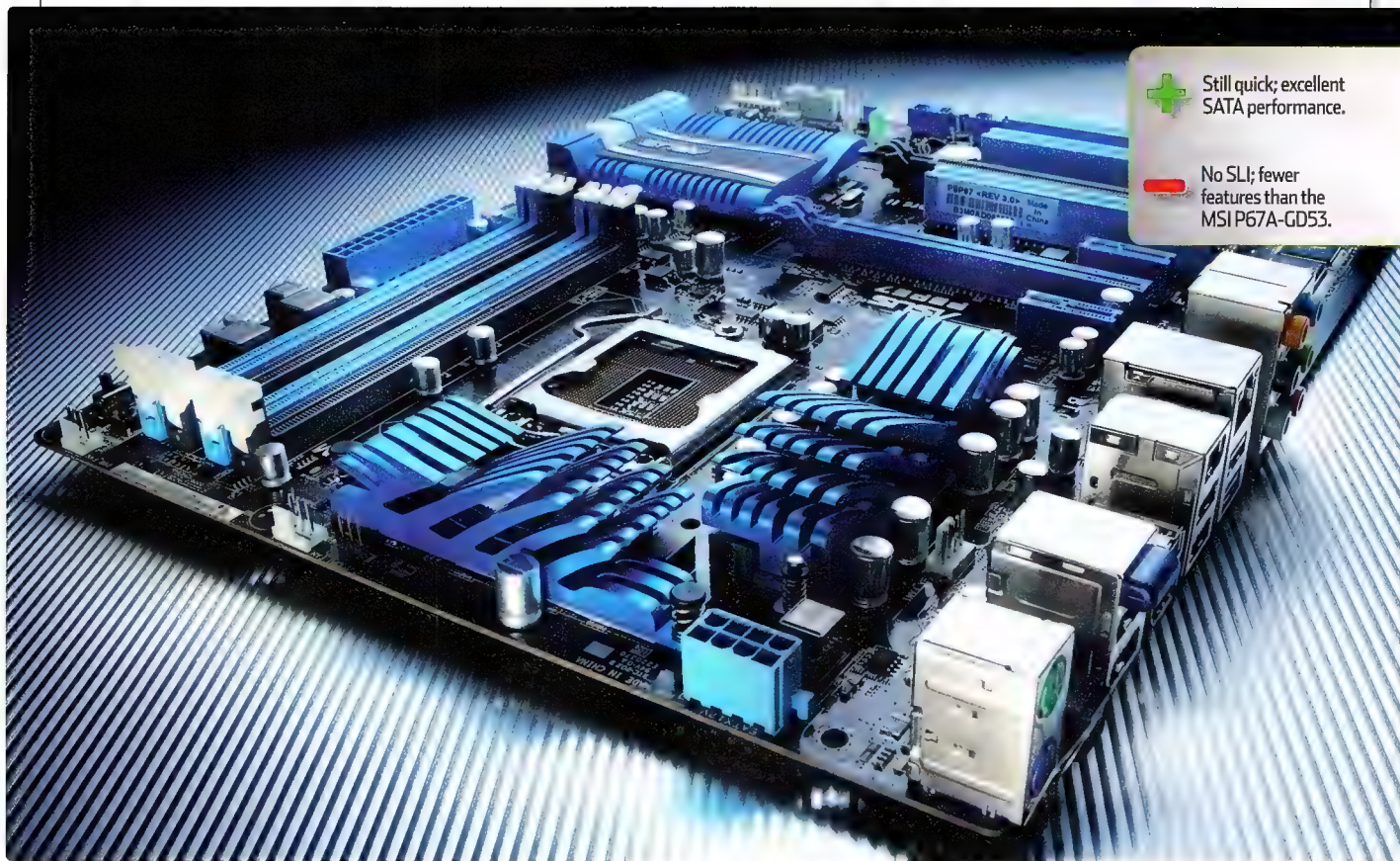
The Sandy Bridge motherboard chipset debacle will probably go down as one of the most epic and expensive tech industry cock-ups of all time. Thankfully, the issue is no longer a problem, as motherboards bearing the new fixed B3 revision of the 6-series chipsets are on the shelves at all good retailers – it's finally okay to buy a P67 motherboard again. As LGA1155 processors are biblically fast and miraculously overclockable, they make for compelling upgrades. You'll need a good motherboard to unlock all this high-speed goodness, though, and

there's a pretty good array of choices on the market at the moment. This is a good thing, but it can make choosing a motherboard seem like a daunting task. To help you decide, we've taken seven of the latest B3 revision LGA1155 motherboards in the \$100 to \$200 price bracket and put them through their paces. We've tested them in everyday media tasks, such as image editing and video encoding, as well as games, and rigorously assessed their overclocking potential. This month's motherboard Labs test is compulsory reading if you're in the market for a new motherboard.



Asus P8P67

It's still quick but you can get a lot more for your money elsewhere.



 Still quick; excellent SATA performance.

 No SLI; fewer features than the MSI P67A-GD53.

Street Price \$150 Supplier ASUS
Website www.asus.com.au

The Asus P8P67 looked good when it first came into our labs, but then the whole SATAII debacle got in the way. It finally returns in a slightly different guise, now, as Asus is using the revised B3 silicon following the Sandy Bridge recall. A lot of water has passed under the bridge since then, though, so we're finally getting to include this great LGA1155 motherboard in this month's Head2Head to see how it stacks up against the latest competition. There's been no change to the base spec of the P8P67; it still sports two 16x PCI-E slots, two 1x PCI-E slots and three PCI slots. Unfortunately for dual-GPU enthusiasts, the lower 16x slot is only equipped with four lanes of bandwidth. While it's CrossFireX-compatible, this means that you won't get the best out of your second graphics card. The P8P67 also lacks the on-board power switches and convenient CMOS reset switch of other boards on test.

The P8P67 is a little more flush when it comes to storage connections though; it complements the two SATA 6Gbps and four SATA 3Gbps connections provided by the P67 chipset with an additional two Marvell

9120-based SATA 6Gbps ports. These proved to be very quick too, providing an average read speed of 353MB/sec. This was actually fractionally quicker than the 339MB/sec that the SATA 6Gbps ports connected to the P67 chipset provided. Layout is just as good as the first-revision motherboard we saw several months ago. All eight SATA ports are positioned parallel to the board while the fan headers, 8-pin EPS12V and 24-pin ATX power connectors are all located near the edge of the PCB. At stock speeds, the P8P67 performed well, scoring an overall Media Benchmarks score of 1,904. This was a little behind the other Asus boards on test but ahead of the MSI P67A-GD53, if only by five points. Gaming performance was again good, if not spectacular. Its minimum frame rate of 73fps in Arma II: Operation Arrowhead was the third best result we saw. Overclocking the P8P67 was a pleasant experience, largely due to Asus' excellent EFI interface. Options are logically grouped and values can be keyed in directly. Frustratingly, the P8P67 struggled to deal with the slow-spinning fan on our test cooler; a CPU fan error message flashed up each time we booted the board, forcing us to disable the CPU fan-speed check in the BIOS.

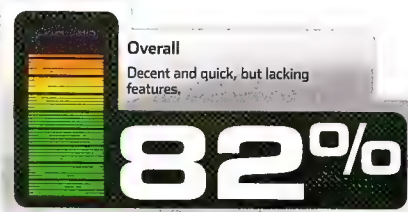
After a few minutes of tinkering, we had our test chip running at the giddy heights of 5GHz.

We achieved this with a CPU multiplier of 50, a CPU PLL of 1.9V and a VCCSA of 1.125V. We also had to pump 1.44V through the vcore to keep this overclock stable – this is a relatively high amount, and we wouldn't advise running this overclock without a competent CPU cooler installed.

At these speeds, the P8P67 demolished our Media Benchmarks – its overall score of 2,691 was bettered only by the MSI P67A-GD53 and the Asus P8P67-M Pro. Gaming saw a similar boost with the minimum frame rate jumping to 81fps. This was the second best result on test.

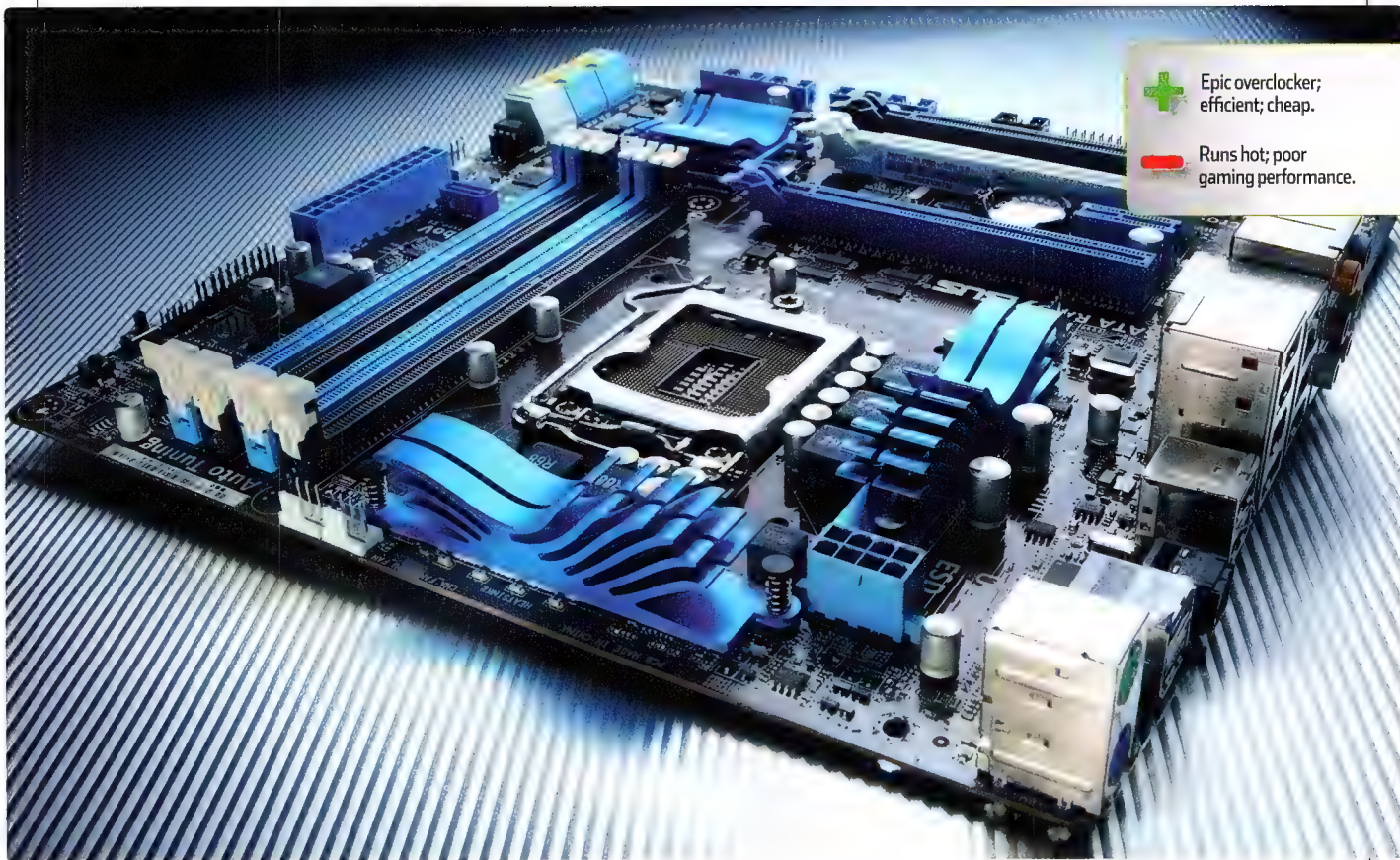
The P8P67 is a quick motherboard that's let down by a lack of features; it lacks on-board power switches and a CMOS clear switch, and it isn't SLI-compatible. It's also more expensive than some similar motherboards, making the MSI P67A-GD53 better value for money.

PAUL GOODHEAD



Asus P8P67-M Pro

Small and quick, but its tiny heatsinks become very hot when overclocking.



Street Price \$165 Supplier ASUS
Website www.asus.com.au

Manufacturing motherboards that conform to the micro-ATX form factor poses a number of challenges for manufacturers, as there's simply less space to play with. The flip side, though, is that the boards cost less to produce, as they require fewer raw materials. As a result, the P8P67-M Pro is the second cheapest motherboard on test.

A cursory glance at the PCB reveals three 16x PCI-E slots. You won't be running 3-way SLI or CrossFireX on this motherboard anytime soon, though, as the third slot is only compatible with 1x and 4x devices. In addition to these, the P8P67-M Pro has a single 1x PCI-E slot – so you're out of luck if you're still using a PCI sound card.

The P67-M Pro's layout is generally good, although the 8-pin EPS12V power connector is a little more inland than we'd ideally like to see. One irregularity is the peculiar positioning of the additional on-board SATA 6Gbps port. This is a surge-protected port (although we're sceptical about how many hard disks fail due to power surges through a SATA port) and it's located in the no man's land between the 24-pin ATX power connector and the RAM slots.

The P8P67-M Pro's stock speed performance in our Media Benchmarks was good; its overall result of 1,928 was the second best on test, while the 2,784 video encoding score was also superb. Unfortunately, the board couldn't keep up with other motherboards on test in gaming; its minimum frame rate of 70fps was the slowest result we recorded. SATA speeds were a different matter, however – the average 356MB/sec read speed of its P67-based SATA 6Gbps ports was the best on test.

Overclocking the P8P67-M Pro was interesting, as its EFI is more sparsely populated than the other Asus motherboards on test – only two of the normal four CPU voltage options were present, and vcore adjustments are made with offset as opposed to absolute values. This didn't seem to affect the P8P67-M Pro, though, as it achieved an amazing overclock of 5.1GHz, which is the highest stable clock speed we've seen from our Intel Core i5-2500K test chip. What's more, achieving this overclock required a vcore of just 1.34V and a VCCIO of 1.1V, which is significantly less than the amount we needed to push through the other boards in this test. At this speed, it's not surprising that it returned the highest Media

Benchmarks scores we've seen from a P67 motherboard. Gaming performance also improved drastically, but not enough to place it up among the other boards in this test. We also grew concerned at how hot the board's small VRM and Southbridge heatsinks became when overclocked. We saw no signs of instability, but you'd be well advised to make sure there's plenty of airflow gliding over the board to run this kind of overclock for extended periods.

The P8P67-M Pro proved to be an epic overclocker, but its below-average gaming performance and poor on-board cooling let it down. As a result, you'd be better off opting for the superior MSI GD53 unless you specifically need a micro-ATX motherboard.

PAUL GOODHEAD



Asus Sabertooth P67

Great gaming performance but it's no overclocking champion.

Street Price \$260 Manufacturer ASUS
Manufacturer www.asus.com.au

The Asus Sabertooth P67 has been one of the most talked-about LGA1155 motherboards across a range of fora. You can immediately see why, as the Sabertooth P67 is visually distinctive thanks to the huge plastic shroud that covers the majority of the motherboard.

This is Asus' new TUF Thermal Armour, which is included on all of its Sabertooth motherboards. TUF stands for The Ultimate Force, and motherboards bearing this moniker are, Asus claims, built to higher specifications than standard motherboards with the aim of making the board ultra-hardy. To reinforce this point, the Sabertooth P67 includes a certificate in the box that details the military-level tests to which the on-board chokes, capacitors and MOSFETs have all been subjected.

This is all well and good, but it's little more than a gimmick, as none of the components that you're going to bolt to the Sabertooth P67 will have passed any of these tests. There are some tangible benefits to purchasing a board in the TUF range, though, such as the

blow downwards towards the motherboard – as Intel's reference cooler does – something we'd hope anyone buying the Sabertooth P67 wouldn't be using. In addition, the air will be quite warm, having passed through the CPU cooler's heatsink. The shroud also made it challenging to fit our test cooler, as it's quite close to the socket mounting holes.

Thankfully, the shroud is removable and apart from this, the Sabertooth P67 is a fairly standard affair. The two PCI-E 16x slots support SLI and CrossFireX, and there are three 1x PCI-E slots and a single PCI slot, so there's plenty of room for other expansion cards. It's clear that proper attention has been paid to the layout of the Sabertooth P67 too, as all the important sockets and headers are located on the edge of the PCB. All the SATA ports are aligned parallel to the PCB too, aiding cable tidying.

The heatsinks on the Sabertooth P67 are finished in the same ceramic coating that we've seen on previous TUF boards and are pleasingly chunky. The two VRM heatsinks are also linked by a heatpipe, meaning that they should share

The P67 includes a certificate that details the military-level tests to which its components have been subjected.

extended five-year parts and labour warranty.

Asus claims that the primary benefit of the Thermal Armour is to enhance the cooling ability of the motherboard; it's designed to channel air from the CPU cooler over important areas of the motherboard. In reality, this will only work with coolers that

the cooling burden more evenly than on boards with isolated VRM heatsinks. We're concerned, though, that the Southbridge sink is swamped by the Thermal Armour shroud, and will therefore receive very little airflow in most cases.

Performance

At stock speeds the Sabertooth P67 was the quickest board on test. Its overall score of 1,936 in our Media Benchmarks was fractionally quicker than the Asus P8P67-M Pro and 40 points clear of the competition, which all scored around the 1,900 mark. It's score of 1,613 in the image editing task was particularly noteworthy.

Gaming was where the Sabertooth P67 came into its own, though, and its minimum frame rate of 76fps was the quickest stock speed result we saw; only the MSI P67A-GD53 could get close and even then it still fell short by 2fps. As with the other Asus motherboards on test, SATA performance was a highlight for the Sabertooth P67. Its 3Gbps average read speed of 279MB/sec was equal best and the 353MB/sec it achieved over its SATA 6Gbps ports was the

second quickest speed we saw.

Overclocking the Sabertooth P67 is a relatively easy task; the Asus EFI implementation is excellent. Unfortunately, though, we weren't able to coax our test chip to 5.1GHz, which we know it's capable of achieving, settling instead for 4.9GHz. We played around with all the extra settings available in the board's EFI, including Asus' new VRM Spread Spectrum settings, but nothing helped with stability above this clock speed.

A 4.9GHz overclock isn't anything to sniff at, but it's a disappointing result given that the cheaper Asus P8P67-M Pro managed a higher overclock. The latter required a lower vcore than





Unparalleled gaming performance; looks good.



Shroud doesn't work with a tower cooler; cheaper boards overclock more; expensive.

that of the Sabertooth P67, which needed a vcore of 1.4V as opposed to the 1.34V that the P8P67-M Pro needed.

At these settings, the Sabertooth P67 powered through our test suite but its overall Media Benchmarks score of 2,662 was the slowest. This underlines just how competitive the LGA1155 market is at the moment and how much performance even budget motherboards are capable of offering.

Thankfully, the Sabertooth P67 was still unbeatable when it came to gaming. Its minimum frame rate of 82fps was the best result on test, although the Asus P8P67 was just 1fps slower.

Conclusion

The Sabertooth P67 is a unique beast. Its looks are likely to divide opinion and we remain sceptical about whether or not the Thermal Armour is anything but a massive heat trap. Its performance was variable too; at stock speeds, it's quick, but it didn't overclock as well as other boards such as the Asus P8P67-M or the MSI GD53. While its gaming performance was consistently excellent, that isn't enough to secure it a recommendation on its own. It's far more expensive than other similarly capable motherboards, so value for money isn't a strong point either. Unfortunately, it lacks features such

as on-board power and CMOS clear switches – genuinely useful additions, which means that the Sabertooth P67 would only make a good, rather than exceptional purchase.

PAUL GOODHEAD



Overall

Great gaming performance – at a price.

78%

ASRock P67 Extreme4

Loaded with useful features, and offers solid performance without breaking the bank.

Street Price \$185 Manufacturer ASRock
Manufacturer www.asrock.com

We've seen a number of ASRock motherboards pass through our lab over the years, but for one reason or another, most failed to hit the sweet spot. To its credit, though, ASRock has kept plugging away, tweaking the formula here and there. It has finally arrived at the P67 Extreme4, which is loaded with useful features.

The board retails for around \$185, so it sits in the upper end of our budget for this Labs test, while staying significantly cheaper than the Asus Sabertooth. It's not surprising, then, that the P67 Extreme4 includes the largest extras bundle of all the motherboards on test, and with many enthusiast-level features too.

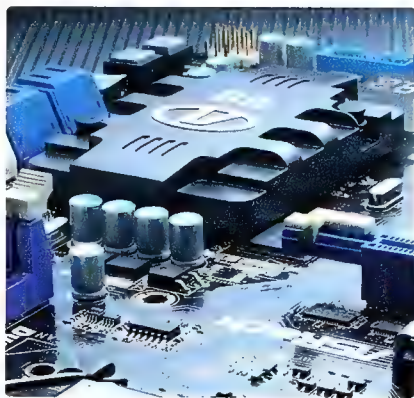
The on-board power and reset buttons, for example, are a useful addition, as they'll make it easier for you to test that all your new components work correctly before installing them into your case. Equally useful are the POST error code readout, which helps diagnose what's wrong with your PC if it fails to boot properly, and the bundled

Cooling is handled by three chunky heatsinks, two of which straddle the VRMs, while the third is tasked with keeping the Southbridge happy. The two VRM coolers are linked via a heatpipe, which should help stabilise temperatures across the two chunks of metal. Unfortunately, while the heatsinks are functional, they lack the wow factor of some of the examples seen on other boards in this test. Their shape is rather plain and the dull grey colour ASRock has chosen for them is also pretty drab.

The P67 Extreme4 is also the only motherboard on test to support 3-way CrossFireX, as all of its 16x PCI-E slots are CrossFireX-certified. If, for some bizarre reason, you decide to run with this configuration then be aware that the last slot will only provide four PCI-E lanes, rather than the eight lanes the other two slots will receive. These lanes don't come from the CPU either; instead, they come from an integrated PLX PEX8608 chip, so there's likely to be a degree of performance overhead with which to contend. Nvidia fans, on the other

The P67 Extreme4 includes the largest extras bundle of all the motherboards on test, and many enthusiast-level features.

USB 3 breakout box, which occupies a spare drive bay and connects to the motherboard's on-board USB 3 header. This gives access to USB 3 ports if your case doesn't support them or if it only supports them via pass through cables. Overclockers can rejoice – a clear CMOS button is located on the rear I/O plate for when things go a little too far.

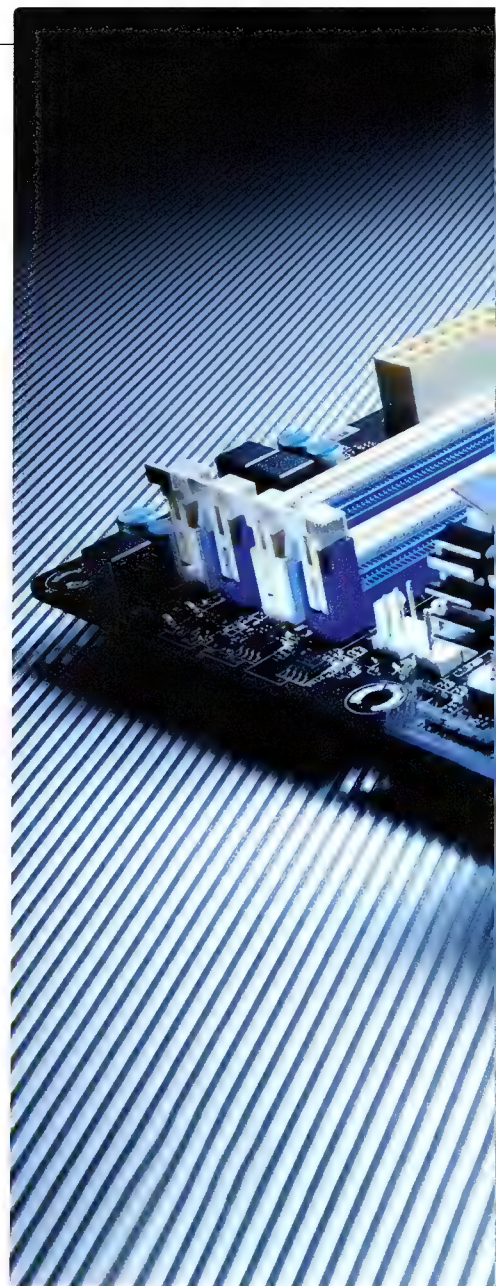


hand, are limited to two graphics cards with the P67 Extreme4. You'll also need to make use of an on-board 4-pin Molex power connector on the motherboard if you want to run 3-way CrossFireX, which is awkwardly located between the VRM heatsink and the expansion slots.

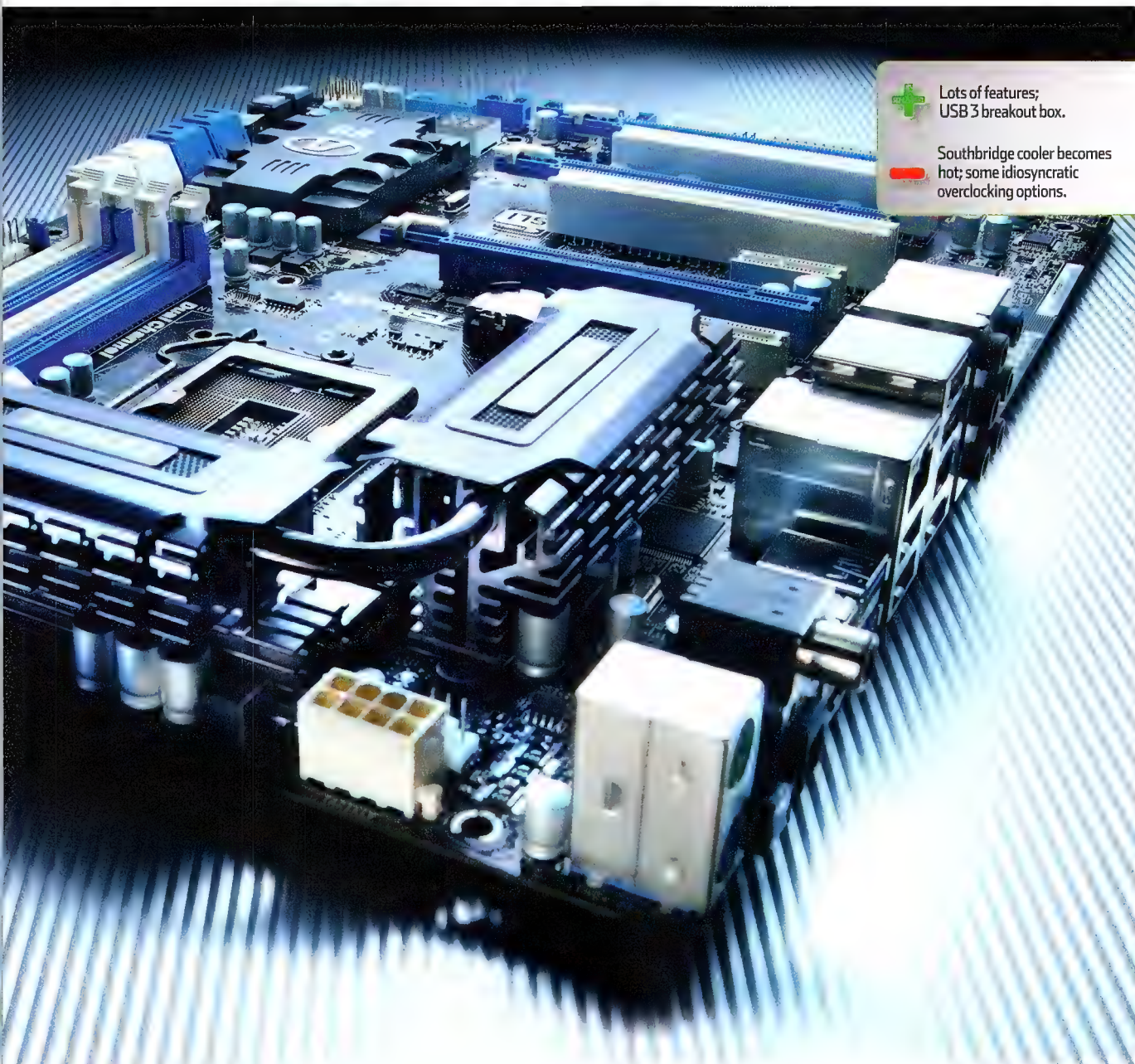
More thought has been put into the placement of the other sockets, with both the 24-pin ATX and the 8-pin EPS12V power connectors located right on the edge of the PCB, as are the fan headers. The SATA ports are aligned conveniently, with all eight lying parallel to the board to aid tidy cabling.

Performance

At stock speeds, the P67 Extreme4 scored 1,890 overall in our Media Benchmarks. This was the slowest stock-speed score in this Labs test, but the difference was tiny. There was only a gap of 46 points between the P67 Extreme4 and the quickest motherboard at stock speeds – the Asus Sabertooth P67 – for example, which is a margin of only two per cent. What did concern us, however, was how hot the Southbridge



heatsink became when the motherboard was under load for extended periods of time. We didn't encounter any stability issues, but we'd want to make sure our case's air cooling was up to scratch. The P67 Extreme 4 was more on the ball when it came to SATA speeds, though, producing results that were in line with the many of the other boards on test. They were still slower than the Asus motherboards, though, which seem to have SATA read and write speeds wrapped up across the board. Gaming was also a highlight for the P67 Extreme; it didn't attain the heady heights of the Asus Sabertooth P67, but it outperformed other boards on test. Overclocking proved to be slightly more challenging than we'd anticipated. Part of this was simply down to familiarity – this was our



Lots of features;
USB 3 breakout box.



Southbridge cooler becomes
hot; some idiosyncratic
overclocking options.

first time with an ASRock EFI – but there were some idiosyncrasies with the board too. When we tried our first overclock, for example, we were bemused to see the clock speed jumping all over the place in Windows. A little investigation found that this was because we'd left the Turbo Boost power limit (the maximum power in watts that the CPU can draw when turbo boosting) settings in the EFI at their default options. This is normal when overclocking a P67 board – in our experience, these settings are usually overridden when you change the core voltage options, but this wasn't the case in the P67 Extreme4. Still, it was an easy fix, requiring us to raise the short and long duration power limits, and increase the core current limit to 300W. After this tweak, we were able run our test chip up to 4.9GHz, which

is a little way behind some of the other boards on test. The P67 Extreme4 was perhaps less streamlined than some other contenders when it came to recovering from failed overclocks, and often needed to be manually reset; otherwise, it was a straightforward and painless experience. The P67 Extreme4 scored a reasonable 2,665 in our Media Benchmarks, which was quicker than the Sabertooth P67. When overclocked, the P67 Extreme4 excelled in games – its minimum frame rate in Arma II of 78fps was the third best on test, despite having a lower overclock.

Conclusion

The P67 Extreme4 may not be the quickest motherboard on test but it's within just a few percent of the frontrunners. Add to this its

reasonable price and long list of useful features & extras, and you have a solid motherboard that would make a sound base for an LGA1155 PC. The only problem is that the MSI P67A-GD53 is noticeably cheaper, overclocks a little better and has many of the same features.

PAUL GOODHEAD



Overall

Well featured, but not quite a standout.

87%

MSI P67A-GD53

A great mix of features, speed and value.

Street Price \$185 Manufacturer MSI
Manufacturer www.msi.com.au



Before the Sandy Bridge fandanglery, MSI sent us the P67A-GD55 to play with. We liked the board, but it was just a little overpriced compared with the Asus P8P67. MSI seems to have taken these comments on board, though, and for this Head2Head, it sent us the P67A-GD53, which is slightly cut-down but substantially cheaper. This means that the P67A-GD53 tips the scales at just under \$200, which puts it towards the more expensive end of the motherboards on test in this test, but not by much. It's a standard ATX board, unlike the MSI P67A-G45 and the Asus P8P67-M Pro, and wears the same three heatsinks as the more expensive P67A-GD55. The two heatsinks that sit near the CPU socket are tasked with cooling the VRM circuitry, and while they look a little puny at first, they're more than up to the task.

This is because the P67A-GD53 is equipped with MSI's Military Class II VRM components. This all sounds rather silly, but the super ferrite chokes run noticeably cooler than the chokes on other manufacturer's

require as much airflow to do their job. This is good news if you want to build a quiet PC, whether it's air-cooled or water-cooled.

We were also pleased to see on-board power and reset switches on the P67A-GD53. These have a fairly niche appeal, but are very useful when you're either testing your new build before you install it in your case or fiddling around inside your PC adding upgrades at a later date. Also present is an OC Genie button, which promises one-second overclocking. We aren't massive fans of automatic overclocking buttons, but it made basic overclocking a quick and easy job.

The P67A-GD53 also retains the SLI and CrossFireX support of the P67A-GD55, which means that fans of dual GPU setups are kept happy. There's plenty of room between the two 16x PCI-E slots too, so your GPU coolers should have a fighting chance of keeping your precious cards cool. Complementing the two 16x slots are three 1x PCI-E slots and a pair of PCI slots.

The P67A-GD53 has seen some cost-cutting in its ancillary connections. It lacks the I/O panel FireWire port that many of the motherboards in

At Stock speeds the P67A-GD53 was in the thick of the action. It wasn't the quickest board on test, but the margins are tiny.

motherboards. The Hi-c CAPs that make up the second part of the voltage regulation module, which the P67A-GD45 lacks, also play their part, as they're more thermally tolerant than standard solid-state capacitors, so they don't require as much cooling. All this adds up to provide significant benefits – the VRM heatsinks are smaller, allowing for more room around the CPU socket and they don't

this Labs test have, for example, and has only two USB 3 ports, rather than the four that are quickly becoming the norm. Confusingly, the board still sports an internal USB 3 header, even though the controller chip that serviced it has been removed. This header instead provides a pair of USB 2 connections, although you'll need to use the bundled adaptor to use them.

Performance

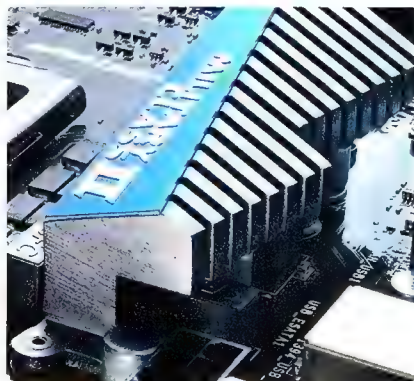
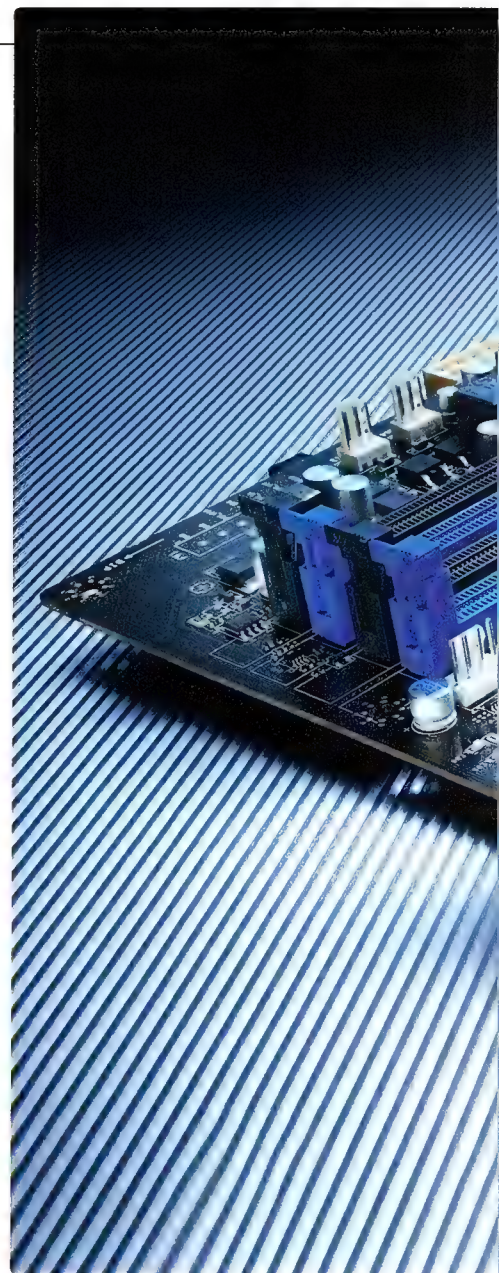
At stock speeds, the P67A-GD53 was in the thick of the action. It wasn't the quickest board on test but, as we've mentioned before, the margins are tiny. Its overall score of 1,899 in our Media Benchmarks was only 37 points behind the Asus Sabertooth P67, for example. Gaming was a different story, however, as the P67A-GD53 returned a minimum frame rate of 74fps. This was the second best result on test, slower only than the very gaming-friendly Sabertooth P67.

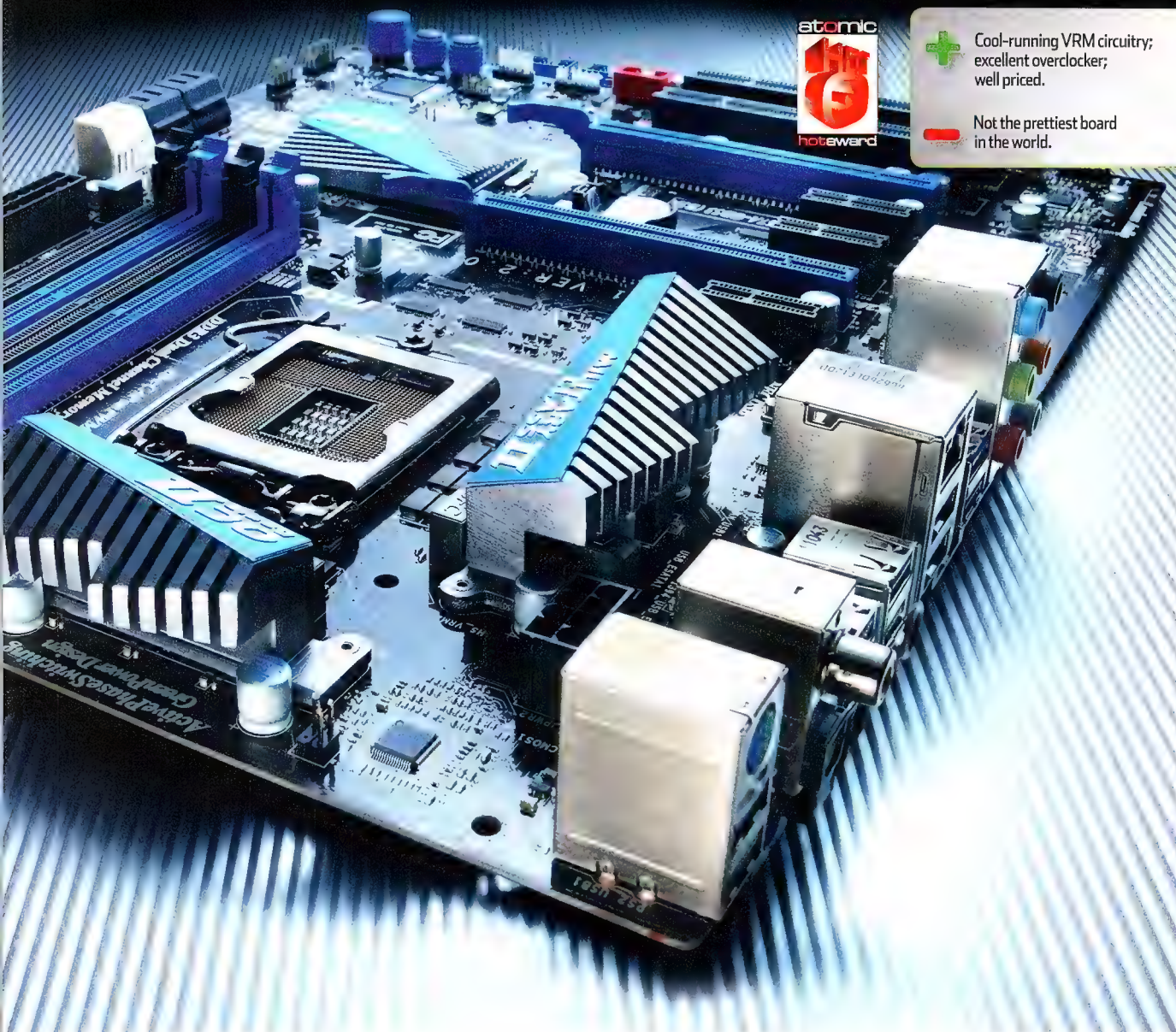
SATA read and write speeds were good, if not spectacular. The 3Gbps average read speed of 244MB/sec was faster than ASRock P67 Extreme4 and the MSI P67A-G45, but slower

than Asus' offerings. The 6Gbps read speeds told a similar story; they were the quickest of the non-Asus motherboards, which seems to be the best result MSI could hope for given Asus' apparent domination in this area.

Overclocking the P67A-GD53 was an easy task, as the EFI is sensibly laid out. It's a little more colourful and cartoony than the Asus EFI, which put us off a little, but it's an effective interface. It was also effective at recovering from failed overlocks, politely dumping us back into the EFI if we became a touch too ambitious. After a little tinkering, we were able to ramp up the frequency of our test CPU to 5GHz. This is 100MHz behind the best result in this test, but it's still a fantastic result.

To achieve this, we had to pump 1.42V





Cool-running VRM circuitry; excellent overclocker; well priced.



Not the prettiest board in the world.

through the vcore, set the System Agent voltage to 1.145V and push 1.23V through the CPU I/O. These voltages are fairly high, but the VRM heatsinks remained much cooler than other motherboards on test during stress-testing, even with no airflow running over them. This is in sharp contrast to other boards such as the Asus P8P67-M, which needed a dedicated fan pointed at its tiny VRM heatsinks to prevent them from reaching ludicrous temperatures.

The P67A-GD53 reacted better than most boards to this bump in clock speed. It leapt above the competition that bettered it at stock speeds, and was faster than motherboards that achieved similar overclocks such as the MSI P67A-G45 and the Asus P8P67. Its overclocked overall Media Benchmarks score of 2,693

was the second best on test behind the Asus P8P67-M Pro, which was running our test CPU at 100MHz faster than the P67A-GD53.

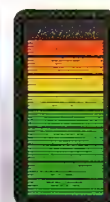
Gaming performance also saw an improvement thanks to the overclock, although it wasn't in the same magnitude as we saw in media applications. The board's new minimum frame rate of 76fps was simply a mid-table result.

Conclusion

The P67A-GD53 is a great board, as MSI has made sensible decisions about which features to keep and which to cut out. The inclusion of on-board power switches and a rear panel CMOS reset switch are useful additions, and the removal of the internal USB 3 ports and rear FireWire port are sacrifices with which we can

live quite easily. The VRM circuitry is its party piece, though, as it ran cool and stably, even when we were shoving bucket-loads of extra voltage through it. If you're in the market for a new LGA1155 motherboard then we've yet to see a more rounded example than the MSI P67A-GD53.

PAUL GOODHEAD

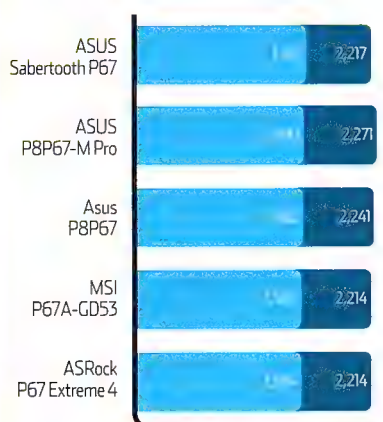


Overall

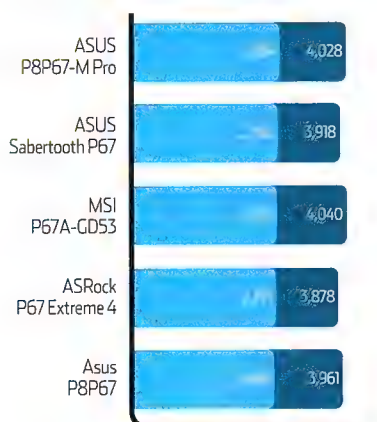
An impressive, well-priced all-rounder.

90%

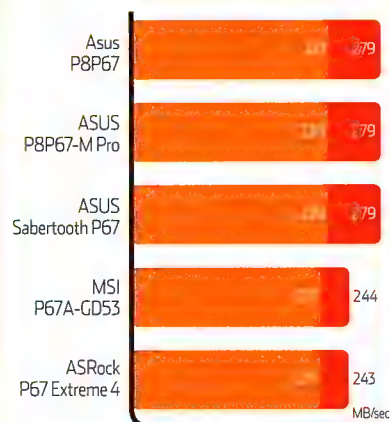
Gimp Image Editing



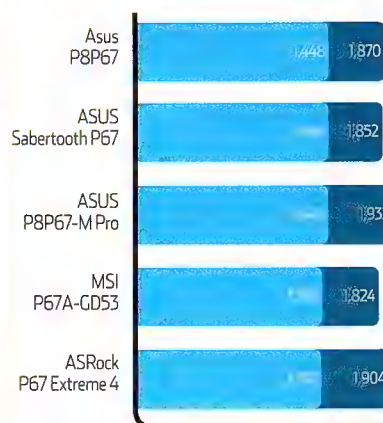
Hanbrake H.264 Video encoding



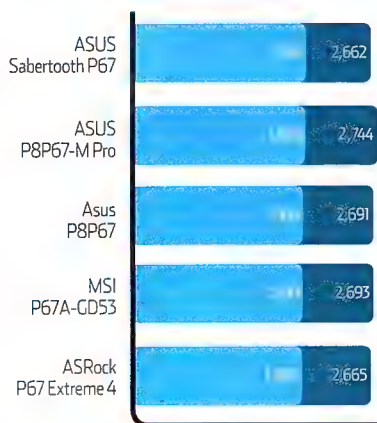
SATA 3Gbps



Multi-tasking

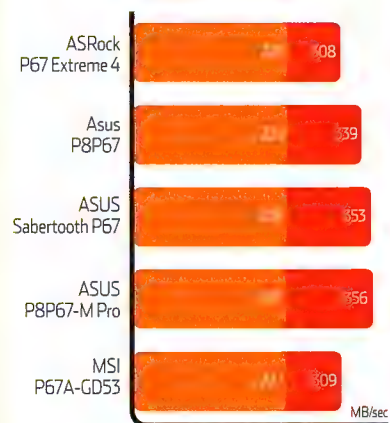


Overall



Stock speed Overclocked

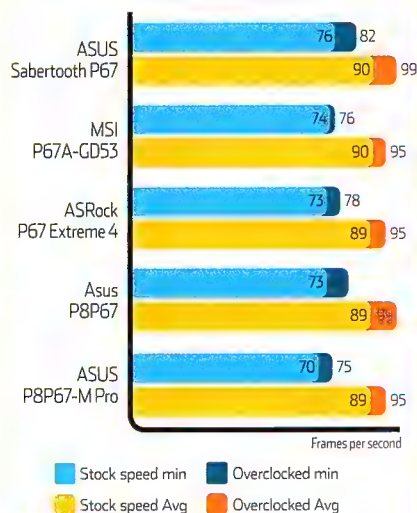
SATA 6Gbps



Read Speed Write speed

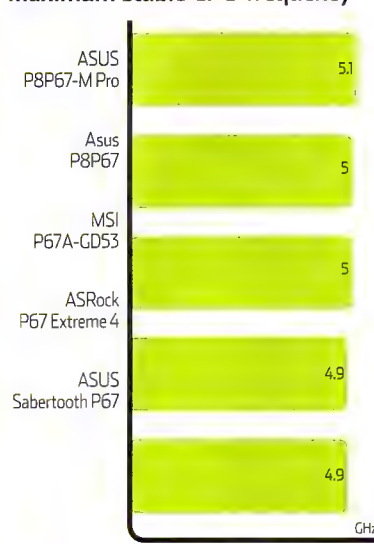
ARMA II: operation Arrowhead (DX9)

1920x1080 4xAA "Very High"



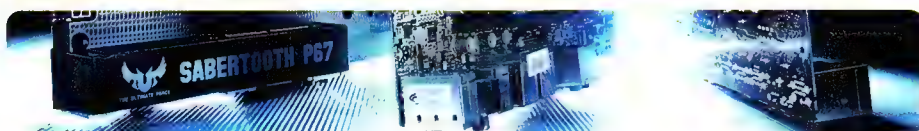
Frames per second

Maximum stable CPU frequency

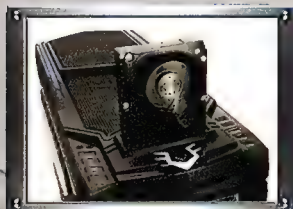


GHz

ASUS P67 MOTHERBOARD
MSI P67A-GD53
cooling
TEST h2h
media
GHz
FSB CPU CMOS
encode



Galaxy Episoda Chaser MK-1



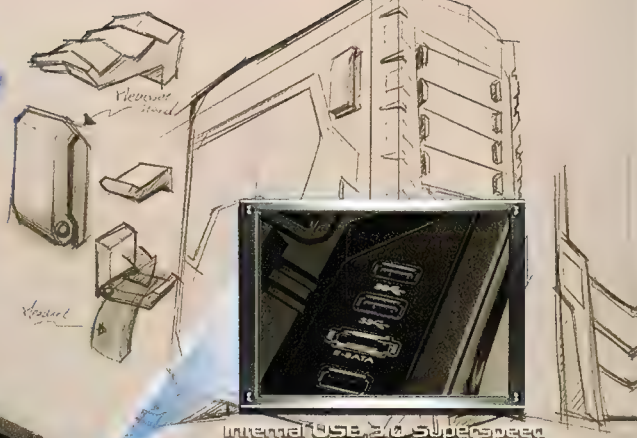
Top HDD-docking Station



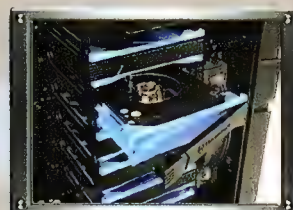
Headset Holder



Supports up to 3 VGA Cards



Internal USB 3.0 SuperSpeed



Tool-Free Device



CHASER SKETCH Cable Management

Tt Thermaltake
Global Power 1911

TR2 BRONZE

600, 700, 800 WATT

PERFECT BALANCE

BETWEEN

POWER & PRICE



80 PLUS
BRONZE

3 Years warranty

www.thermaltake.com.au

Premium Resellers

Online

Mwave 1300 727 446 mwave.com.au
PCCG 03 9551 0889 pccasegear.com.au
Tech Buy 02 9648 1816 techbuy.com.au
Umart 07 3369 3928 umart.com.au
IJK 02 9745 0877 ijk.com.au

NSW

J&W Comp 1300 592 667
Orange IT 02 9281 8982
MSY 02 9648 4116
PC DIY 02 9648 1001
PC LAN 02 9649 3288

VIC

CPL 03 8542 8688
MSY 03 9560 2288
Nexus 03 9663 9988
PC DIY 03 9077 9811
Scorptec 1300 726 770

QLD

Computer 07 3421 3200
Alliance
Gamedude 07 3387 1531
MSY 07 3217 9070
Umart 07 3369 3928

WA

Austin 08 9201 2788
MSY 08 9344 1002
SA
MSY 08 8212 1656
PC DIY 08 8410 0446

msi



msi
MILITARY CLASS II
HIGH STABILITY COMPONENTS

SFC
30% Higher Power



Hi-C CAP
Tantalum Core



Solid CAP
10 years lifetime

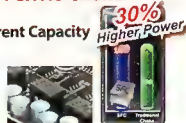


TOP QUALITY & STABILITY

Hi-C CAP - Tantalum Core
High reliability & Longer lifetime



SFC - Super Ferrite Choke
30% Higher Current Capacity



Solid CAP
10+ Years ultra long Lifetime



P67A-GD80 (B3)



P67A-GD65 (B3)



Premium Resellers

QLD

Gamedude
PC Land

PC GoGo
Gocomp
FTC Computers

3353 Pacific Hwy, Spring wood QLD
32 Zillmere Rd Boondall QLD
8 Ocean st Maroochydore QLD
176 Mulgave Rd Westcourt Cairns
1351c Gympie Road Aspley QLD
Unit 2, 47 Collinsvale St, Rocklea, QLD
Shop 79B Sunnybank Plaza Shopping Center, Sunnybank QLD

Tel: (07) 3387 1500
Tel: (07) 3633 0014
Tel: (07) 5451 1812
Tel: (07) 4031 6820
Tel: (07) 3263 7988
Tel: (07) 3722 5150
Tel: (07) 3344 7100

NSW

Mwave Australia
TX Computer Solutions
Zip Computers
Megawave Computers
Orange IT - Haymarket
J&W Computers
IT Destination
Leading Pacific Australia

Unit 5, 1-3 Nicholas Street Lidcombe, NSW
Shop 2, 89 York Street, Sydney
45 Dumaresq, Campbelltown, NSW
19 Queen Street Beaconsfield NSW
Shop 15 & Shop 9, Level 1, 730 George St Haymarket, Sydney NSW
23/4-6 Celebration Dr, Bella Vista NSW
1/730-742 George Street, Sydney NSW
Unit 36/ 378 Parramatta Rd, Homebush NSW 2140

Tel: 1300 727 446
Tel: (02) 9262 1588
Tel: (02) 4628 6777
Tel: (02) 9698 1593
Tel: (02) 9281 8982
Tel: (02) 9629 7288
Tel: (02) 9211 8696
Tel: (02) 9763 7688

VIC

PC Case gear
Centrecom

PCDIY
CNET Technology
Budget PC
Standard Computers
Scorpion Technology

<http://www.pccasegear.com>
centrecore Sunshine 128 Hampshire Road VIC
www.centrecom.com
2 Cambridge Street Box Hill VIC
Braybrook (Head Office) 250 Ballarat Road, Braybrook, VIC
Unit 111, 45 Gilby Rd, Mt Waverley VIC
104 Millers Road Altona North, Victoria
Unit 4/2 Garden Rd, Clayton VIC www.scorpiontech.com.au

Tel: (07) 3387 1500
Tel: (07) 3633 0014
Tel: (07) 5451 1812
Tel: (07) 4031 6820
Tel: (07) 3263 7988
Tel: (07) 3722 5150
Tel: (07) 3344 7100

SA

PC DIY
Get Right Computers
All Needs Computers

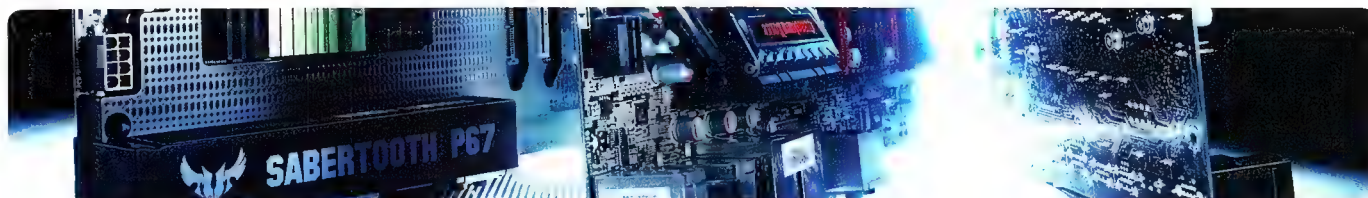
132 Franklin Street Adelaide SA
28 Grote Street Adelaide SA
28 Grote Street Adelaide SA

Tel: (08) 8410 0446
Tel: (08) 8231 0622
Tel: (08) 8211 8661

au.msi.com

Feature Table

	Asus P8P67	Asus P8P67-M Pro	Asus Sabertooth P67	ASRock P67 Extreme4	MSI P67A-GD53
Price (inc VAT)	\$150	\$165	\$260	\$185	\$185
Dimensions (mm)	305mm x 244mm	244mm x 244mm	305mm x 244mm	305mm x 244mm	305mm x 244mm
Ports					
16x PCI-E	2 (one at 16x or two at 16x and 4x)	3 (one 16x or two 8x and one 4x)	2 (one 16x or two 8x)	3 (one 16x or two 8x and one 4x)	2 (one 16x or two 8x)
1x PCI-E	2	1	3	2	3
PCI	3	0	1	2	2
DIMM	4 slots (max 32GB)	4 slots (max 32GB)	4 slots (max 32GB)	4 slots (max 32GB)	4 slots (max 32GB)
Storage	4 x SATA 3Gbps, 4 x SATA 6Gbps,	4 x SATA 3Gbps, 3 x SATA 6Gbps, 1 x eSATA 6Gbps	4 x SATA 3Gbps, 4 x SATA 6Gbps, 2 x eSATA 3Gbps	4 x SATA 3Gbps, 4 x SATA 6Gbps	4 x SATA 3Gbps, 2 x SATA 6Gbps
Audio	4 x surround audio, optical S/PDIF out	4 x surround audio, optical S/PDIF out	4 x surround audio, optical S/PDIF out	4 x surround audio, optical S/PDIF out	4 x surround audio, optical S/PDIF out, coaxial S/PDIF out
Network	1 via Realtek 8111E Gigabit LAN	1 via Realtek 8111E Gigabit LAN	1 via Intel 82579 Gigabit LAN	1 via Realtek 8111E Gigabit LAN	1 via Realtek 8111E Gigabit LAN
USB2/USB3	6/2	14/2	14/4	12/4	12/2
FireWire	1	2	2	2	2
Features					
RAID	0, 1, 5 and 10 via Intel P67	0, 1, 5 and 10 via Intel P67	0, 1, 5 and 10 via Intel P67	0, 1, 5 and 10 via Intel P67	0, 1, 5 and 10 via Intel P67
Audio	8 channel HD Audio via Realtek ALC892	8 channel HD Audio via Realtek ALC892	8 channel HD Audio via Realtek ALC892	8 channel HD Audio via Realtek ALC892	8 channel HD Audio via Realtek ALC892
Fan headers	4	4	5	6	5
Overclocking					
Base Clock range	80Mhz - 300Mhz	80Mhz - 300Mhz	80Mhz - 300Mhz	95Mhz - 110Mhz	38MHz - 480Mhz
CPU multiplier range	34 - 255	34 - 255	34 - 255	16 - 60	16 - 60
CPU voltage (max)	1.99V	2.135V	1.99V	1.7V	1.8V
VCCIO voltage (max)	1.7V	1.685V	1.313V	1.870V	1.55V
System Agent voltage (max)	1.7V (VCCSA)	-	1.7V (VCCSA)	1.2V	1.585V
CPU PLL voltage (max)	2.2V	-	1.9V	2.349V	2.43V
RAM voltage (max)	2.2V	2.135V	2.20V	1.8V	1.492V
Southbridge voltage (max)	1.7V	1.685V	1.4V	1.646V	1.724V
Other					
Cooling	Passive chipset and VRM heatsinks	Passive chipset and VRM heatsinks	Passive chipset and VRM heatsinks, shroud to direct airflow	Passive chipset and VRM heatsinks	Passive chipset and VRM heatsinks
Extras	4 x SATA cables, Q connector, USB2/ eSATA backplate	2 x SATA cables, Q connector	4 x SATA cables, Q connectors, case sticker, SLI bridge	4 x SATA cables, IDE cable, 2 x molex to SATA power adapters, SLI bridge, USB 3 breakout box, on-board power and reset switches, error code readout	2 x SATA cables, molex to SATA power adapter, M connectors, SLI bridge, onboard power and reset and overclocking switches



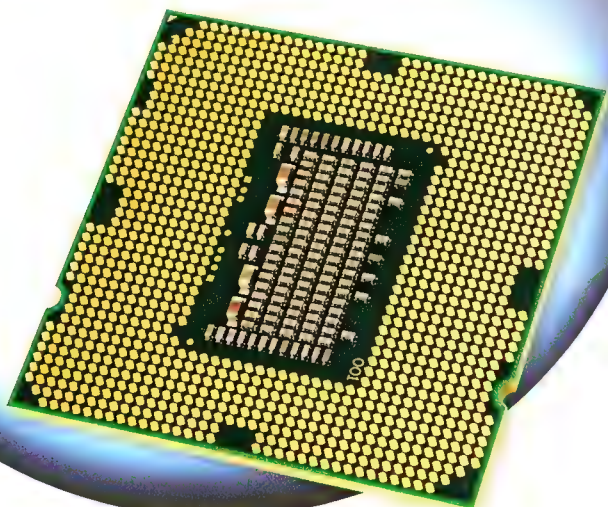
KITLOG

These are four of our basic systems, with something for every taste. **The Game Box** is put together with money-saving in mind, but also an eye to getting as much bang for buck. Our build has just gotten a little more expensive, but for that few hundred you're also getting cutting edge performance and one of the most overclockable chips you can get today.

It's great, it's broken, it's back...

Man, Sandy Bridge has been a hell of an awkward release, but by now boards should be coming back into retail and we can start getting on with all these planned builds that stalled back in January.

It really is the sweetspot in terms of price and performance, and we like sweet...

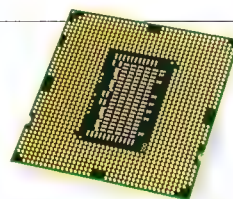


The Perfect PC, on the other hand, is the system everyone aspires to, with nothing but the best parts – without going crazy, though. It's a collection of all the greatest hardware that we'd pick without a budget, sure to impress with performance and sheer style.

Oh, and if you're wondering what the Ref IDs are, that's the ID of that article on our website. Just enter it like this – www.atomicmpc.com.au/?NUMBER – and you'll go straight to that review.

THE GAME BOX

CPU



Intel Core i5 2500-K
PRICE \$290

Sandy Bridge's combination of cost and overclocking prowess is awesome.

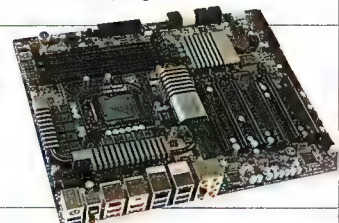
Issue 122, Page 36

MOTHERBOARD

GIGABYTE P67A-UD7
PRICE \$365

A great P67 board with some nice features.

Issue 122, Page 46



MEMORY



G.Skill Ripjaws F3-10666CL7D-4GBRH
PRICE \$130

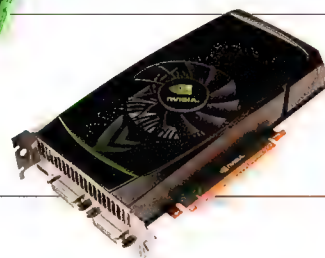
Great value, tight timings, and some flexibility.

VIDEOCARD

NVIDIA GTX460
PRICE \$245

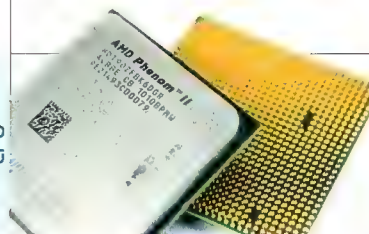
A reference-design card, but plenty fast for gaming bliss.

Issue 116, Page 38



THE PERFECT PC

CPU



AMD Phenom II X6 1090T

PRICE \$355
Six cores of high-powered processing joy.

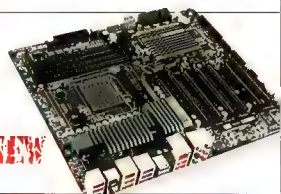
Red ID: 220395

MOTHERBOARD

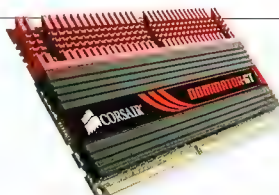
Gigabyte GA-990FXA-UD7
PRICE \$270

Elegance and power, what more could you want?

Issue 127, pg 38



MEMORY



Corsair Dominator GT CMT4GX3M2A2000C8
PRICE \$220

Red-hot memory for dual-channel speed.

VIDEOCARD

ATI 6990
PRICE \$849

The new fastest video card on earth!

Issue 124, Page 36



COOLER



Coolermaster Hyper 212

PRICE \$45

Nice cooling for a very affordable price.

CASE



Antec Lanboy Air

PRICE \$220

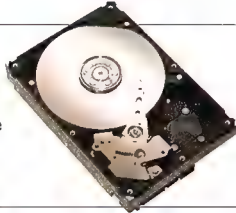
Unique looks and excellent cooling design.
Issue 120, Page 48

SYSTEM DRIVE

1TB HDD

PRICE \$90

A thousand gigabyte storage drive on the cheap.



KEYBOARD

Razer Arcosa

PRICE \$50

A cool-looking keyboard that'll serve you very well.
Ref ID: 149483

DISPLAY

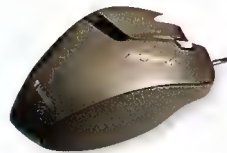


Viewsonic VX2233WM

PRICE \$215

21.5 inches of value-packed screen, great buy.
Issue 108, Page 42

MOUSE



Verbatim Rapier V1

PRICE \$65

Great gaming performance and nifty features.
Issue 96, Page 43

AUDIO

Plantronics Gamecom 777

PRICE \$80

Solid set of cans with great audio.
Issue 101, Page 41

Onboard Realtek ALC889A

A decent chip that does the job.

POWER SUPPLY

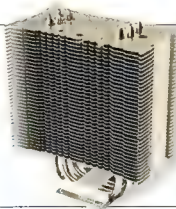
OCZ ModXStream Pro 600W

PRICE \$105

Plenty of wattage, reliable, modular for neatness.
Issue 109, Page 59

SUBTOTAL: \$1890

COOLER



Noctua NH-U12P SE2

PRICE \$95

Two fans, quiet and nice overclocking capacity.
Issue 107, Page 48

CASE



Silverstone Temjin Series TJ11

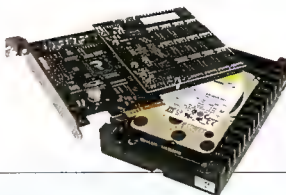
PRICE \$600

Few can match the sheer space, cooling power, and sturdy construction.
Issue 124, Page 46

SYSTEM DRIVES

OCZ REvo Drive x2 & WD 600GB VelociRaptor

PRICE \$780 + \$400

Superfast SSD with zippy storage.
OCZ: Issue 121, Page 43
WD Ref ID: 220323

KEYBOARD

Razer BlackWidow

PRICE \$160

The new benchmark in gaming quality.
Issue 122, Page 50

DISPLAY



Dell U2410

PRICE \$699

In-Plane Switching, 1.07 billion colours and 24 inches.

MOUSE



Microsoft Sidewinder X8 Wireless

PRICE \$105

Cable-less, comfortable, lag-free and fraggable!
Ref ID: 148422

AUDIO

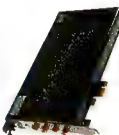
Logitech Z-5500D

PRICE \$400

Earth-shakingly good.
Ref ID: 22626

Creative X-Fi Titanium HD

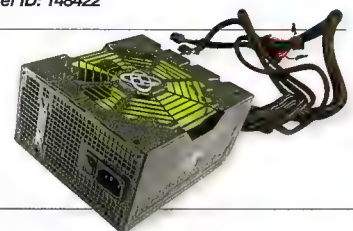
PRICE \$270

Seriously serious sound.
Issue 115, Page 47

POWER SUPPLY

XFX 850W

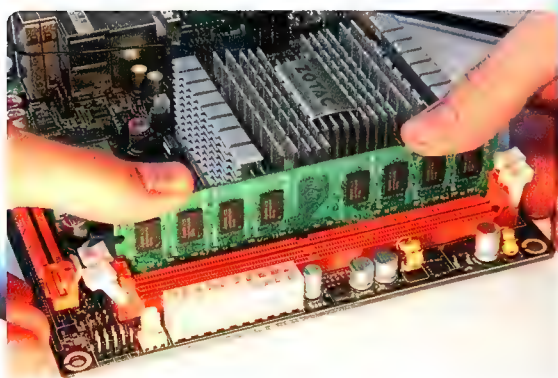
PRICE \$215

Plenty of power, ultra-stable rails and a great price.
Issue 107, Page 50

The **LAN Rig**, the ultimate in portable gaming power – go anywhere, frag anyone. No longer will you be tied to a desk or forced to awkwardly manhandle your full-sized rig, helped by a convenient handle and beefy tech. Perfect for wowing people at LANs, the tech inside is fast enough to run any game, and boasts enough speed to keep your game running at full clip even if other programs intrude in the background. After all, no-one wants to miss a headshot.

There are many benefits to running an ITX system, aside from the challenge of choosing compatible components, but here are just a few of the plusses:

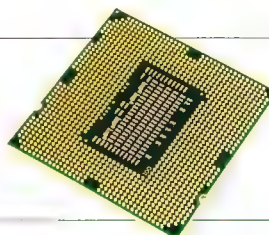
- Small footprint, so it'll fit damn near anywhere – even under a monitor.
- Lower power consumption due to restrained component choice.
- Generally low-noise due to the 'wind tunnel' design of most cases.
- Easily moveable around the house, or even taken to a mate's place – all you need is power and a screen.



Finally, for the more entertainment-minded – and really, that's all of us – there's **The Mini**, ready to play movies and music quietly and efficiently. The basic guts are fast enough for general tasks, and the IGP can handle High-Definition content. You can also choose from three entirely optional upgrades to suit your needs best: a graphics card for WoW, TV tuner to catch the game, or a Wireless card to sync without cables. The perfect energy-conscious build.

THE LAN RIG

CPU



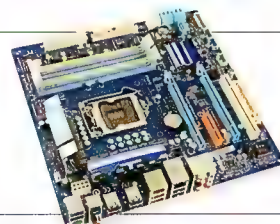
Intel Core i5 760
PRICE \$245

Intel's budget quad is more than you'll need in a chip!
Issue 106, Page 36

MOTHERBOARD

GIGABYTE P55M-UD4
PRICE \$200

Great overclockability, nice value.
Issue 107, Page 40



MEMORY



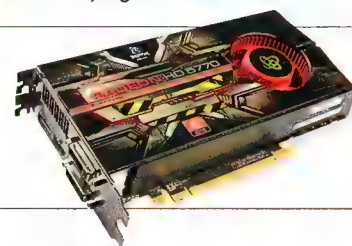
G.Skill Ripjaws 2000MHz
PRICE \$190

Great value memory with amazing overclocking.
Issue 106, Page 52

VIDEOCARD

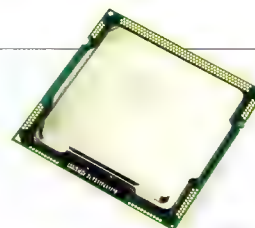
ATI 5770
PRICE \$190

A decent value way to get into DX11.
Ref ID: 169775



THE MINI

CPU



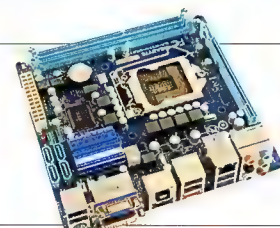
Intel Core i3 530
PRICE \$140

Speedy dual-core with an IGP for HD video duties.

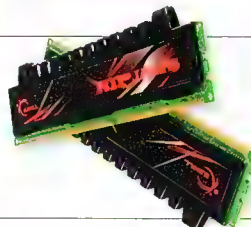
MOTHERBOARD

GIGABYTE H55N-USB3
PRICE \$145

Tiny ITX form factor with up to 4 storage devices. Neat.
Issue 113, Page 39



MEMORY



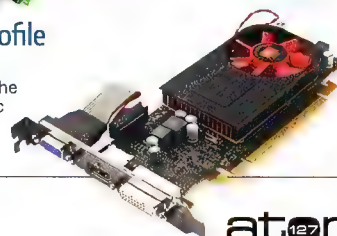
G.Skill Ripjaws F3-10666CL7D-4GBRH
PRICE \$130

4GB of fast memory is plenty for running multiple HTPC media streaming apps.

VIDEOCARD

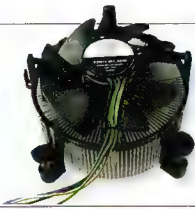
ATI 5570 Low Profile
PRICE \$100

Graphical grunt in half the space. Enough for basic games, given the size.



SUBTOTAL: \$1655

COOLER



Intel Stock Cooler

PRICE FREE

Does the job, fits under PSU well.

CASE



Silverstone SG04

PRICE \$160

Small case with handle; add two 120mm fans for awesome cooling.
Ref ID: 148266

SYSTEM DRIVE

1TB HDD

PRICE \$90

A thousand gigabyte storage drive on the cheap.



KEYBOARD

Razer Arctosa

PRICE \$50

A cool-looking keyboard that'll serve you very well.
Ref ID: 149483

DISPLAY

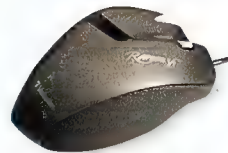


Viewsonic VX2233WM

PRICE \$215

21.5 inches of value-packed screen, great buy.
Issue 108, Page 42

MOUSE



Verbatim Rapier V1

PRICE \$65

Great gaming performance and nifty features.
Issue 96, Page 43

AUDIO

Plantronics Gamecom 777

PRICE \$80

Solid set of cans with great audio.
Issue 101, Page 41

Onboard Realtek ALC889A

A decent chip that does the job.

POWER SUPPLY

Corsair HX-520

PRICE \$140

Modular, efficient and keeps size manageable in cramped case.



SUBTOTAL: \$1033

COOLER

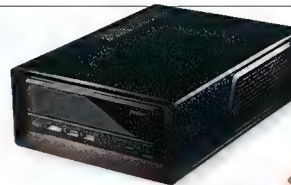


Scythe Big Shuriken

PRICE \$55

Tiny 58mm height, quieter than a sponge.

CASE



Antec ISK 300-150

PRICE \$110

Included 150W PSU, good build quality, and decent airflow.

SYSTEM DRIVE

WD Scorpio Blue 640GB

PRICE \$120

Fast 2.5" internal storage – grab two for more space!



COOLING

Noctua NF-R8

PRICE \$22 x 2

Get some quiet, positive flow in this mini build.



OPTICAL



Lite-On DS-8A4S

PRICE \$70

Slim internal DVD drive for movies, installs or backups.

KEYBOARD



Logitech diNovo Edge

PRICE \$199

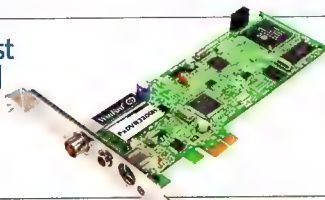
Wireless board with a trackpad for mousing.

TV TUNER

Leadtek Winfast PxDVR3200 H

PRICE \$100

Get TV in your PC. H.264 recording ftw!

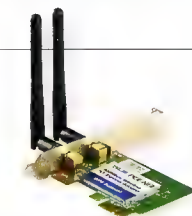


WIRELESS

ASUS PCE-N13

PRICE \$45

Zippy 802.11N for wireless HD video streaming.

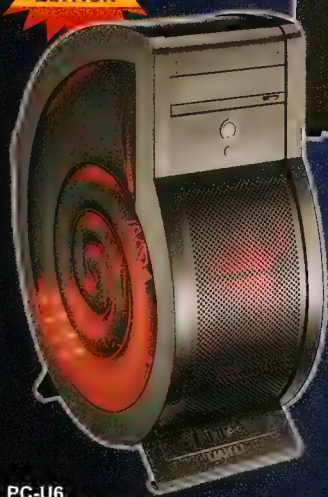


ALUMINUM PC CASE

Super-speed
USB 3.0

20 pin-plug

**2011
SPECIAL
EDITION**



PC-U6

M/B type: **M-ATX**

• 219 x 412 x 500 mm (W, H, D)



PC-A05FNB
M/B type: **ATX**

PC-6
M/B type: **ATX**

PC-Z60B
M/B type: **ATX**
SATA hot swap

PC-Z70B
M/B type: **HPTX**
SATA hot swap

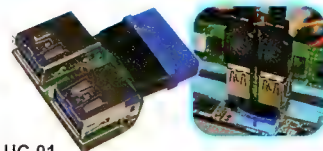
PC Accessories

**3.5" S-ATA
HDD-ROM EXTERNAL
ENCLOSURE EXTERNAL
eSATA & USB 3.0**



EX-503

USB 3.0 CONVERTER



UC-01

Lancool



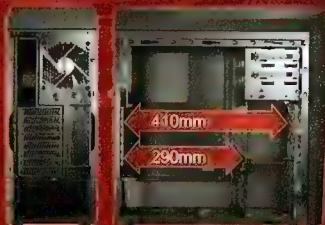
PC-K59

PC-K57

Side panel with mounts for 120 / 140mm fans



BATTLE IS WHAT I DO



• Supports long graphics card/s.
• External & Internal Finishing in Black Coating.



PC-K63

Super-speed
USB 3.0



**Superb Thermal & Silent Performance, Patented
Tool-less / Anti-vibration Features Designed for
PC Game Enthusiasts and Professionals**



K series Design and Manufacture
by Lian Li Industrial Co., Ltd. In Taiwan
www.LanCoolPC.com

Distributor

mittoni
extreme technology distribution

www.mittoni.com.au
Melbourne Office: 1300 200 000
Sydney Office: 02 9646 3018

VIC: CPL (03) 8542 8688 www.cpl.net.au
PCCG (03) 9551 0889 www.pccasegear.com.au
Inside Technology (03) 9761 3022 www.insidetech.com.au
NSW: Mwave (02) 9649 6184 www.mwave.com.au
IJK (02) 9745 0877 www.ijk.com.au
Corecomputers (02) 9621 2875 www.corecomputers.com.au
AusPCMarket (02) 9646 8000 www.auspcmarket.com.au
Techbuy (02) 9648 1818 www.techbuy.com.au
IT Estate (02) 9630 9630 www.itestate.com.au

QLD: Umart (07) 3369 3928 www.umat.com.au
ITSDirect (07) 5408 5588 www.itsdirect.com.au
SA: MSY (08) 8212 1656 www.msy.com.au
WA: Austin computer (08) 9201 2788 www.austin.net.au
TAS: Tas Principal (03) 6334 6677 www.tpcl.com.au

Finest
Quality
**Made in
Taiwan**



In Praise of the Fisheye

Dan Rutter looks at the world through a Piscean lens...

If you're fortunate enough to have normal human vision, you seem to have a view of the world that's both quite wide, and quite sharp. But actually, there's only a little high-res spot of 'macular' vision in the middle, surrounded by much lower resolution.

Your whole horizontal field of view, from the super-blurry peripheral left edge to the similarly blurry right edge, approaches 180 degrees. The field you perceive as sharp is a lot smaller than that. In photography, a 'normal lens' is one that approximates the perceived view of a human standing in the camera's location; it'll have a left-to-right field of view of only about 45 degrees.

What this really means becomes clear if you pretend your monitor is a literal, physical window into the game-world. If the field of view in the game is set the same as the field of view you'd get through a physical window the size of your monitor and the same distance away, then everything looks fine. If you widen the field of view – let's say, by a factor of two – all you have to do to make everything look fine again is halve your distance from the monitor.

Try it. Run some game with FoV adjustment, wind the field of view up to 120 degrees or something, and move much closer to the screen than your mother thinks is healthy. When the

close and not very distorted, while the outer portion of the image is a less faithful, but very wide, view. Which is actually pretty much what your eyes already do.

But everything, except for the occasional Xenomorph's-Eye View or CPU-intensive add-on for Warsow, is still rectilinear. Until mainstream FPS players find themselves getting pwned by people who've clicked the fisheye button, there'll be no demand for said button to exist.

I hope it happens soon. If only because fisheye-versus-stereographic flame wars can only be more interesting than Nvidia versus ATI. 

Nobody wants to stare at a screen that's ten centimetres away from their eyes...

All of this is complicated enough already, but then you go and start playing computer games.

3D games are famous for giving you an odd view of the world. If the field of view is wide enough to give you decent situational awareness in an action game, then objects at the edges of the screen will appear oddly stretched. Anybody who's fiddled with field-of-view settings in games will be familiar with this; extreme settings give you a sort of land-speed-record view of the world, with massive radial stretching, and things straight in front of you seeming weirdly far away.

Actually, though, there's no distortion at all.

When I'm sitting here with my eyes about 90 centimetres away from my beloved 30-inch monitor, the monitor subtends roughly a normal-lens 45-degree portion of my field of view. If I then set my field of view in a game to 45 degrees, there's no stretch effect at all.

But a 45-degree FoV is not very useful. About 90 degrees is the standard for action games. And then, there's that stretchy effect again.

amount of your actual biological field of view that the monitor covers is the same as your FoV setting in the game, there won't be any distortion.

This is, of course, completely impractical. Nobody wants to stare at a screen that's ten centimetres away from their eyes in the middle and thirty at the corners. We're going to have to wait for affordable wraparound curved screens, or head-mounted displays that create the same effect, before super-wide view angles will be useful.

In the meantime, a better option exists.

All normal 3D games use similar simple 'rectilinear projection', where straight lines stay straight, but get longer and longer as the view gets wider. There are many other projections, though, which trade distortion – straight lines aren't straight any more – for a better view. Standard fisheye, for instance, gives a distinctive circular distortion effect that lets things in front of you seem realistically

Fisheye beats the hell out of a browneye.

dan@atomicmpc.com.au



WIN A PAIR OF

15 TO WIN



The Plantronics GameCom X95 is a wireless gaming headset delivering full stereo sound from 40mm speakers that can be used for more than 20 hours before replacing batteries. Users can immerse themselves in games, music and movies without disturbing others.

**WORTH
\$149 EACH!**

Subscribe online at
www.subscribeNOW.com.au/ato/1101

PLANTRONICS HEADPHONES!

Reading *Atomic* doesn't make your ears bleed, however if used incorrectly it could take your eye out! If you do feel the need to subject your tympanic membrane to some serious noise, then subscribing to Atomic might just be the way to do it. This month, you could win a pair of awesome Plantronics Gamecom X95 headphones. They're valued at \$149 and we've got 15 to give away, so get subscribing!



SUBSCRIPTION RATES?

3 YEARS (36 ISSUES) FOR \$179.95 - SAVE \$142

2 YEARS (24 ISSUES) FOR \$129.95 - SAVE \$84

1 YEAR (12 ISSUES) FOR \$69.95 - SAVE \$37

NEW ZEALAND

1 YEAR (12 ISSUES) FOR A\$79.95

**EXCLUSIVE
SUBS COVER!**



Haymarket Subscriptions

Reply Paid 13 Queen Victoria Building NSW 1229



1300 610 765

YES, Please send an **ATOMIC** subscription to

☐ Me ☐ Gift

☐ **3 YEARS** - (36 issues) \$179.95 = **SAVE \$142**

☐ **2 YEARS** - (24 issues) \$129.95 = **SAVE \$84**

☐ **1 YEAR** - (12 issues) \$69.95 = **SAVE \$37**

☐ **1 YEAR NZ** - (12 issues) \$79.95

MY DETAILS:

MR/MRS/MS/MISS FIRST NAME SURNAME

ADDRESS

SUBURB/TOWN STATE POSTCODE

DAYTIME PHONE EMAIL

AND/OR PLEASE SEND A GIFT SUBSCRIPTION TO:

MR/MRS/MS/MISS FIRST NAME SURNAME

ADDRESS

SUBURB/TOWN STATE POSTCODE

DAYTIME PHONE EMAIL

PAYMENT DETAILS: ☐ Cheque/Money order for \$_____ is enclosed (payable to Haymarket Media) (ABN 61 083 06914)

OR charge my ☐ Visa ☐ MasterCard ☐ American Express

Card No. _____

Cardholder's signature

Expiry date

Cardholder's name

☐ Please tick if you do not wish to receive any offers or information from Haymarket Media or its partners.

Offer only available to Australian subscribers until 9/8/2011. For overseas prices and terms and conditions, visit www.atomicmpc.com.au/subscribe or call +61 2 8296 5495. Quote '1101' when ordering subscription. Authorised under NSW Permit Number: LTPM/10/00462 and ACT TP10/02328.1

PREMIUM ESPORTS AND GAMING PERIPHERAL

Tt[®] ESPORTS
By Thermaltake

gamers! check this out!



www.tteal.com.au



CHALLENGE IS THE GAME
TAKE IT TO THE NEXT LEVEL, WITH Tt ESPORTS GEAR

Authorized Distributor for Australia

PH: 1300 269 927

Anyware is a wholesaler and does not sell direct to public.

The above products can be purchased from most independent computer dealers throughout Australia.

Call the number above for your nearest reseller.

Available **EXCLUSIVELY** from

Anyware[™]
COMPUTER ACCESSORIES

TUTORIAL

HANDS-ON TUTORIALS FOR THE TECHNICALLY MINDED



TUTORIAL CONTENTS

ATOMIC.EDU 70
Chris Taylor explains the process of becoming a cop.

HOW TO... 72
We show you how to use a soldering iron without injury.


WEEKLY NEWSLETTER

Keep up with the latest from Atomic!

Atomic isn't restricted to the pages of this magazine, and there's still plenty more to be had online.

Make sure you grab the latest content, competitions and posts straight from your favourite mag by signing up for the weekly newsletter – it's what we would do!



Becoming a cop



Watcha gonna do... whatcha gonna do when they come for you?

We looked at the defence force a couple of months ago so now it's time to look at law enforcement. Law enforcement is a decent choice of career – although obviously some jobs within it come with risks to life and limb which you may not care to take. The entry-level pay for most law enforcement agencies is okay, and there is significant room for career advancement.

Five-oh

At the moment, the state and territory police forces don't specifically recruit IT specialists; instead, you get on-the-job training for positions that require high-level computing skills. This means, of course, you can apply straight out of secondary school or whatever else it is you've been doing with your time. In their recruitment drives, the police tend to look first for people who will make decent frontline coppers. Looking at Victoria Police's careers website, for example, the 'suitability test' pretty much just asks you if you're fit, healthy, capable of driving a manual car, not an unscrupulous cold-hearted bastard, willing to use a gun and committed enough to partake in several months worth of training. The formal entry requirements are fairly basic – any prior tertiary qualifications are seen by recruiters as a bonus, though, so don't feel any past or current studies were/are a waste of time.

Despite this, some state and territory police forces have partnerships with universities. The Western Australia police force has a partnership with Edith Cowan that means after studying for eighteen months you can apply to join the police force and, after you complete your six months police training, get an Associate Degree in Criminology and Justice.

The Feds

Unlike the state and territory police forces, Australia's various national law enforcement agencies specifically seek out graduates of technology-related courses (as well as graduates from faculties such as law and commerce). These include the Australian Federal Police, Australian Crime Commission, Customs and Australian Securities and Investments Commission.

Customs has a graduate-entry program that is open to graduates from damn near any old field. Information technology graduates are specifically in demand, though, but the application process is somewhat laborious. You apply by a specific time of the year, undergo tests in a specific place on a specific day and commence your training at a specific date. You probably also need to move to Canberra, too, which may turn a lot of people off, given in this day and age you can get all the porn you want for free in the comfort of



your own living room. Then again, you do get to spend your time with b-grade Australian actors harassing members of minority groups about shady criminal pasts, pickled scorpion pincers and secret stashes of cash.

The Australian Federal Police also have a graduate program. As with Australian Customs, you don't just apply, get accepted and rock up for training. You follow a set schedule. You have to apply maybe half way through the year (i.e. now) to be considered for next year's graduate-entry positions, just like you would with a scholarship or internship at university. The training program, during which you're assigned a mentor, runs for twelve months. There are roles in policing, of course, but it's also possible to join the Federal Police in non-policing roles such as marketing, administrative support, information technology and so on. It's possible to join the Federal Police if you're interested in a general policing role without any tertiary qualifications but as with the state police forces, a diploma or degree makes you a more desirable applicant.

The Crime Commission is another law enforcement agency that most people will be unfamiliar with. They were established nine years ago to deal with terrorism and organised crime. They specifically seek out IT graduates of various sorts – people with software engineering backgrounds, PhD and Masters-level research students. You should be well versed in the practicalities of computer hardware and software. The Crime Commission also looks for people who may be specialised in IT but also studied subjects from faculties such as commerce, engineering, law or science. The Crime

Commission also seek people with experience in both the public and private sector – in information technology and in other professions and sectors such as law and banking. Having a proven track record of being able to finish tasks is more impressive than a piece of paper that says you're versed in the theory of the tasks.

Jobs with the Crime Commission range from standard IT support stuff – maintaining the networks and ensuring everything's plugged in at the wall and switched on – to serious investigative and analytical work: data mining, forensic accounting, busting rings of kiddie fiddlers. Just like something you'd seen on CSI or one of those other police procedurals on television, except, you know, grounded in reality and using computers that don't require you to hit ten thousand keys just to open a text file. You can't be an ultra nerd like one of those crime show characters either, as you'll maybe be expected to speak in court cases.

The Australian Securities and Investment Commission recruit information technology, as well as other, graduates. They operate on a similar schedule to the Federal Police: apply in the start or the middle of one year to be considered for the next year's graduate-entry program.

Natural po-lice

Aside from the qualifications (or lack thereof) we've discussed, what else do law enforcement agencies look for? In general they expect you to be a healthy specimen of humanity. ASIC and the Crime Commission don't have any fitness requirements, but the Federal Police and various

state forces do. While they do train you, you'll want – and need – to be in reasonable shape before you even consider applying. As with the Defence Force, the police are transparent about their physical fitness requirements and provide all sorts of useful resources, such as detailed breakdowns of the different fitness tests and audio recordings of the horrid beep test, on their websites.

There is also an expectation of mental fitness. As a frontline police officer, which is basically what the state and territory forces seek to recruit, you'll have a lot of responsibility and, of course, carry around a firearm and some sort of less-than-lethal weapon – they don't want any young constables who've got a few wires crossed upstairs. The afore-mentioned 'suitability' test on the Victoria Police website explicitly reminds would-be applicants that police officers are the men and women called to road accidents, murders, assaults, rapes and so on. Basically that in your role upholding the right you'll see some disgusting things and you should be at peace with that.

There are also dangers you need to accept. You can rationally argue that you're statistically unlikely to be killed in the line of duty but you can't argue away the risks of being hurt, potentially seriously, that don't exist – or are nowhere near as great – in other lines of work your tertiary qualifications may get you into.

Qualifications, even those not directly relevant to the job or agency you're applying for, as well as experience in the private and public sector, all count towards your application. The police try to maintain a force that is as diverse as the community they, er, police. Simply knowing your way around computers is a good thing. Then there are the really obvious things, such as having a driver's licence and being able to drive a car with a manual transmission.

Speaking of qualifications, there are dedicated forensics applications offered through some universities but we'd recommend thinking twice about these – the federal law enforcement agencies would doubtlessly look favourably upon them but the problem is they don't qualify you for much else. If you turn out to be otherwise unsuited for the Crime Commission or whoever, you're stuck with a very expensive wall hanging.

You also need to be flexible. Most of those federal agencies expect you to move to the nation's capital – at the very least for the training program, but probably for the job itself too. Even the state and territory police forces tell you that you could be posted wherever they want to post you. You can maybe ask to be posted locally but it's within the contract that they can dump your arse in the middle of nowhere at the commissioner's discretion. As much as the law enforcement agencies talk about recruiting people with a lot of education and experience

behind them, the reality is this part of the industry will dissuade a lot of people.

Law enforcement is a challenging and, let's face it, interesting line of work (even though the reality isn't as glamorous as Numb3rs and its ilk make out). The potential to move up the food chain and make a reasonable amount of money is there. As, sadly, are the risks to your health and well-being if you're a frontline police officer spending the bulk of your time wandering or driving around the streets. And then there's possibility of having to move to Canberra, which is maybe even worse. (E)



Specialise in Project Management

The Faculty of Information Technology is introducing the Project management specialisation due to popular demand from students and the employment marketplace. Project Management can be beneficial to you no matter which industry you belong to or would like to be in such as the aeronautical, construction or technology industries.

Choose from a range of coursework masters, graduate diplomas and certificates across all areas of information technology. Research programs, credit recognition, off-campus study and International Merit Scholarships are also available. Monash offers

cutting-edge research, outstanding academics, superb facilities and a prestigious reputation recognised around the world.

For further information visit it.monash.edu/postgrad

CRICOS Provider: Monash University 00008C



MONASH University
Information Technology

how to... use a soldering iron

Antony Leather shows you how to use a soldering iron for your modding projects without scarring either your fingers or your furniture.

Soldering isn't only a skill for electricians; it's handy for all sorts of PC DIY. Follow our guide, and with practice, you'll soon become proficient at extending cables, creating custom lighting and repairing broken joints. This guide shows you everything you need to know to get started by walking you through a simple wiring repair, but the lessons can be rolled out to more advanced tasks with ease. Just don't tell your friends about your new skills, or you'll be forever fixing their electronics too.



tools you'll need

- Electric soldering iron
- Solder
- Soldering flux
- Soldering iron stand
- Soldering mat
- Solder sucker (optional)

1



PREPARATION AND TOOLS

Prepare any joints or wires by removing any braid or rubber sleeving. It's essential to use a clutter-free desk or a worktop with a heat-resistant mat and no trailing wires to trip over, as the soldering iron becomes incredibly hot and will burn through carpets in seconds.

2



CLEAN THE TIP

A dirty soldering tip can prevent the solder from melting and flowing into joints, as it hinders heat transfer. If you're using an old soldering iron, clean the tip with a brass brush but don't use anything too abrasive.



TAPE COMPONENTS FIRMLY

You'll have no free hands once you start the job, so you should tape the components in place before you start. A Helping Hand tool is even better – it's adjustable, raises the joints off the surface on which you're working and has a magnifying glass.



WET THE SPONGE

The sponge is needed to clean the tip and to remove excess solder. It needs to be used wet, so ensure that it's damp before beginning and don't allow it to dry out, or it will burn and leave residue on the soldering tip.

5

**TURN ON THE HEAT**

Your soldering iron won't be ready to use the instant you turn it on. It takes a few minutes to warm sufficiently to be able to melt the solder. Don't be tempted to leave it though. At the very least, make sure you place it in a stand while it warms up. If you need to leave the room, always turn it off.

6

**COAT THE TIP IN SOLDER**

Apply standard solder to the tip. This helps to clean the point and improve heat transfer when applying the solder, allowing it to run and coat the joint.

7

**WARM THE WIRE AND APPLY FLUX**

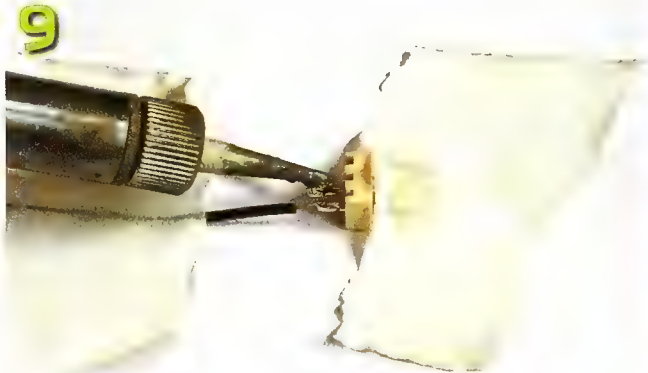
In our example, we're attaching a fan header wire. In this case, it's easier to apply new solder to the wire section first. To do this, bring the tip to the wire to warm it so that it's hot enough to melt the solder. If you aren't using flux core solder, this is where your flux comes in. Flux cleans the metal surfaces, aiding the flow of solder.

8

**BRING THE SOLDER TO THE WIRE**

Apply the solder by touching it to the wire, which should be hot enough to melt it, ensuring it has a generous coating. It's important to bring the solder to the wire and not to the tip.

9

**WARM THE JOINT AND ALLOW SOLDER TO FLOW**

With the wire and connection taped together, bring the tip to the connection, allowing it to warm and melt the solder on the wire. After a few seconds, the solder should melt and fuse the two together. If you find that there isn't enough solder to go around, add more by warming the joint and applying more. A solder sucker isn't essential but can make removing excess solder much easier if you're dealing with small joints.

10

**INSPECT THE JOINT**

Inspect the joint to make sure it's strong. If there are other electrical connections nearby, check that the solder you've applied hasn't caused a short circuit. Finally, wipe the tip on the sponge to remove any excess solder – and don't forget to turn off your soldering iron.

LAMPTRON TOUCH



Touch Screen Fan Controller

LT-FCT

- Touch Manual Controls Or Full Automatic
- Very Easy To Use
- Cool LCD Display

LAMPTRON

ACCESSORIES FOR SERIOUS MODDERS



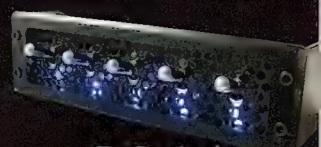
8-Channel Fan Controller
LT-FC8



5-Channel Fan Controller with LCD
LT-FC5V2



5-Switch Fan & Light Controller
LT-HUMMER



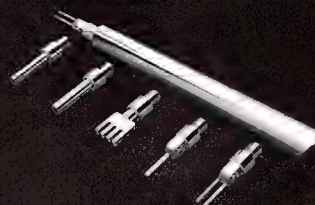
5-Switch Illuminated Alum
LT-FANATIC



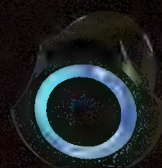
4-CCFL Inverter with Alum housing
LT-INV-4



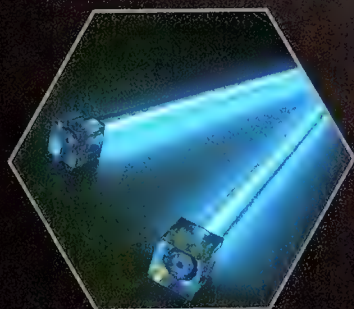
Advanced Slot Protector
LT-SLOTPRO-BK



PSU Modding Toolkit
LT-MODKIT



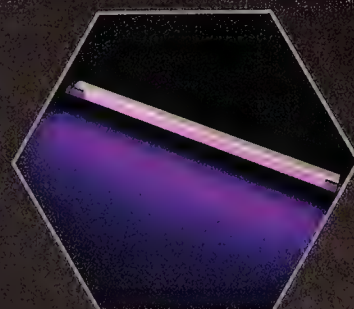
Illuminated Tri Switch
LT-TRISW-BL



CCFL All-in-One Kit
LT-CCFLKIT-BL



FlexLight PRO
LT-CCFLPRO



Spectral Bar
LT-SB-UV

Anyware™
COMPUTER ACCESSORIES

www.anyware.com.au/lamprtron

Anyware is a wholesaler and does not sell direct to public. The above products can be purchased from most independent computer dealers throughout Australia. Call the number above for your nearest reseller.

PH: 1300 269 927

GAMEPLAY

GAMES, GAMING AND GEEKERY COVERED... ATOMIC-STYLE

As you may have gathered from keeping an eye on our website (atomicmc.com.au, in case you were wondering), David recently did his usual trick of leaving the Atomic offices unattended while he jetted off to LA to hang out with c-list celebrities under the guise of 'work'. 'E3 work', to be precise.

Thankfully, these things have to be justified to the people with the money upstairs somehow, so

he's gracing six pages of this fine magazine with all the wisdom he gathered while drinking with celebrities. It's an... epic read.

We've also had a chat with Blizzard and scored all the latest news on the upcoming Starcraft II expansion in our Engine Room, and there's our usual mess of gaming reviews.

Including our verdict on Duke Nukem: Forever, which... oh, we won't spoil it here. Go read it!

Sponsored by



GAMEPLAY CONTENTS

SPECIAL REPORT E3 best in show	76
ENGINE ROOM We chat to Blizzard about Starcraft II's upcoming expansion.	82
Cities in Motion	86
DiRT 3	88
Hunted: The Demon's Forge	90
Infamous 2	91
Duke Nukem Forever	92
Dungeon Siege III	94



76



82



91

Tt esports
By Thermaltake

WWW.TTESPORTS.COM

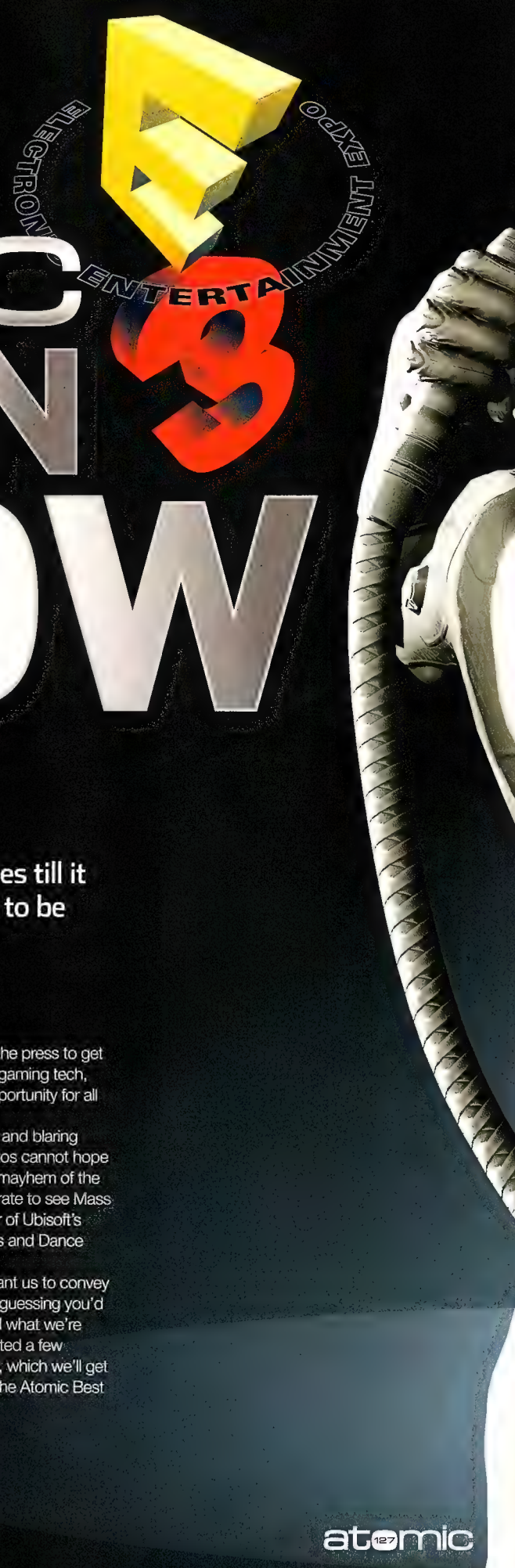
GAMERS! CHECK OUT!



WWW.TTES.COM.AU



premium esports and gaming peripherals



atomic BEST IN SHOW

E3 2011

We came, we saw, we gamed and watched games till it hurt. And boy, is the next year of gaming going to be something magnificent.

Well, that's another 24 hours in an aircraft over the Pacific, another four days in Los Angeles, another metric arse-load of games. It's another E3, and from, we're diving the games to watch out for in the next six to twelve months.

As always, the Electronic Entertainment Expo took place from Monday to Thursday at the LA Convention Center. Also, as always, it's way more show than one gamer, or even one games journalist, can cover. It took us through days before we even made it into the West Hall! There are far more games on show than can be covered in depth, it's kind of sad to say.

But we'd like to think we hit the highlights. At the same time, we've also tried to tee up some future events that we're quietly excited

about. E3 is not only a time for the press to get to see the future of games and gaming tech, but it's also a giant business opportunity for all concerned.

And it's a loud show, a bright and blaring celebration of gaming. Our photos cannot hope to convey the barely controlled mayhem of the E3 stand and its crowds desperate to see *Mass Effect 3*, or the noise and colour of Ubisoft's stand, with its *Rocksmith* shows and *Dance Revolution* routines.

In fact, you probably don't want us to convey that last part... However, we're guessing you'd like to know what we rated, and what we're dubious about. We've also spotted a few interesting trends in the industry, which we'll get to shortly. But for now, on with the Atomic Best in Show Wrap-up!

E3

GAM



The Common or Garden Shooter

Man, there were a lot of shooters at E3 this year. It didn't feel like it at the time, but when we compiled the list of just the ones we saw at the show... damn. Year of the Shooter or what? And note, too, that we're saying shooter, not FPS, as those lines have heavily blurred this year – even when you ignore the RPG/shooter hybrid of *Mass Effect 3*!

Well, let's get it out there and be done with it. We played *Battlefield 3*. The game that was our cover feature a few issues ago was at the show, and in fine form. And it was playable. Even better, it was being demoed on PCs – honest to God, actual personal computers, still, in our humble opinion, the best platform for hardcore gaming.

Hardcore – handy word, that. It pretty much sums up our all-too-short experience of the game. It's serious, unforgiving, and technically demanding. It looks incredible, even at this early stage when the game is still being polished. It's going to change things.

It's that good.

It's not going to outsell *Modern Warfare 3* though – we can admit that. *MW3* is an epic juggernaut of action and over-the-top plotting. It's like a shot of pure adrenaline. Mixed with the blood of Michael Bay! But for all that, it's looking like a supremely polished game for the console shooter generation. And that's a split we can live with – PC gamers have long lamented the coming down of the shooter, and with DICE as EA's mission statement of making PC the preferred platform for *BF3*, this is the shooter for us.

Prey 2, easily the most surprising game of the entire show.



However, don't think that's all there was to the show. In fact, there were a couple of games that really took us by surprise, including *Prey 2*.

Prey didn't really light any fires. It was competent, but nothing to write home about. *Prey 2*, though, is something else. Though a sequel, it features a different central character, who's been kidnapped by the same aliens as the first game introduced. After a brief encounter, he wakes up years in the future, on an alien world, missing chunks of memory – and now a bounty hunter. The game features great weapons and gadgets, an open world filled with quests and sidequests, and a deep movement system, all combined with great action. It looks like it could be a stealth hit.

Metro: Last Light, on the other hand, is less of a surprise. The sequel to *Metro*, it's another unforgiving-looking shooter with incredible detail, and a truly impressive engine. It's dark and scary, too, though possibly not as scary as *Far Cry 3*.

That was Ubisoft's big surprise, and we're very keen to see if this game can deliver on the frankly terrifying demo we saw at Ubi's main conference. Think *Apocalypse Now* combined with typical *Far Cry* action and you get an idea. A lot of the demo's impact came from a chilling monologue delivered to the antagonist, one that, even now as we type, really sticks with us.

But Ubi had a mess of shooters up its sleeve, and some more surprises, like the under the radar non-announcement that a game we've

atomic
BEST IN
SHOW



BATTLEFIELD 3



atomic

really been looking forward to – Ghost Recon: Future Soldier – is not coming to PC. Huh. On top of that, it's now a purely third person game. A damn good one, too, with great weapons, near perfect co-op mechanics, and a use for the Kinect we actually like, The Gunsmith – a weapon modding mode that lets you virtually craft the perfect weapon using motion and voice controls. It's dead sexy.

However, while PC gamers miss out on Future Soldier, we do get Ghost Recon Online, a PC only, free-to-play FPS that boasts a fully-featured engine, micro-payments for faster XP generation, and class-based action. We got to play it, too, and it's solid, and will hopefully make up for Future Soldier's loss.

Id's RAGE was there, and we've at last gotten some hands-on with it. Only on Xbox, mind, but it plays well enough that we're looking forward to more PC action. It's very id, too – lots of gibbing, lots of hard to kill enemies, and some incredibly complex level design. It still feels like a cross between Borderlands and Fallout, but seeing as we love those games...

Best in Show

No surprise here – it's got to be Battlefield 3. It's everything that's great about Bad Company 2, but bigger, better, slicker, and more destructive than ever. Moment of the show, for us, was watching a car's gas tank cook off on a Paris street in our hands on, and the shockwave shook the trees. Not a scripted event – just superlative physics. Good dog.

Our runner up doggie biscuit, however, gets tossed to Prey 2. This is looking to be a great open world shooter, with a wonderfully alien take on noir, and some of the most fluid movement we've seen in any game.

The Shaggy RPG

We didn't get to see a lot of really hardcore RPGs, but what we did see was pretty serious, and almost universally first class. It was also rather confusing, since more and more roleplaying games are crossing into other territories; alternately, other genres are adding

more and more RPG elements. It's an odd modern gaming word we live in.

You may disagree with some of the games we're classifying as RPG here, but, basically, if it has serious plot choice and deep dialogue trees, as well as detailed inventory and skills systems... it's an RPG.

The above certainly counts in Deus Ex, which was at E3 once again. We called it as one of the

games of last year's show, but the odd thing is, since a small hands-on recently, and the footage on show this year, it did seem a little, well, aged. It's hard to say, especially when it's such a detailed game, one that will require time to learn and get the feel for. But we're worried it may be not quite the game we were hoping for as the release date edges closer. We'd also love to be very wrong, though!

Then there's Lord of the Rings: War in the North – it worries us too, and again it's that lack of real experience. We've played it, and it's fun, but at the risk of being rather repetitive in the combat area, at least on console. If the folks at Snowblind take the Dragon Age route, and make the PC version more deep in its controls, it'll make a big difference. Getting to know the skill and inventory system would also help settle our nerves.

However, once past those nervous rapids, we reach a period of calm. Rather brilliant calm, to be honest.

Reckoning: Kingdoms of Amalur, is one of those nuts-and-gum, kind of two-great-tastes games. Except there's much more than two flavours here. There's some rather colourful graphics flourishes, a very deep and unique interlocking systems of skills and almost careers, called Fates, and wide open world full

MASS EFFECT 3



Elder Scrolls: Skyrim almost stole our hearts and minds with its dragons alone!



of interesting enemies and rich story. And the combat? Fast and brutal – just how we like it.

We'd like to say we can be objective over the toss up between Elder Scrolls: Skyrim and Mass Effect 3, but... well, we're Normandy crew, now, and once you get on board that ship you've made your choice.

Skyrim looks awesome – the Creation engine is better than ever, the world wide, real and beautiful, and the combat and inventory systems absolutely best of breed.

And then there's Mass Effect.

Few other games have made you feel part of a breathing world, one that goes on without you, but one that is profoundly affected by your choices. That promise is well and truly kept in Mass Effect 3. It has a refined combat and cover mechanic, far more in-depth skill system (though still strongly following ME2's more basic premise), and gut-punching emotional impact. And, if you play it on Xbox with Kinect... you get squad voice control and spoken dialogue choices. It may not be to our taste, but it's a good use of the tech.

Best in Show

If you were even vaguely paying attention, you should have worked out by now our choice.

The Long-tailed Action Game

If it's possible to have a greater mix of styles, moods and settings than the action games (and, again, remember our caveat about RPGs – the action game is getting rather mixed, too) that we saw and played at E3.

Compare, for instance, Saints Row and Batman: Arkham City. On the one hand, you have a game that showers you with riches and adulation for beating to death a hooker with a giant purple dildo. On the other hand... a game that is rather far away from such bacchanalian excess.

To be honest, some of us here at Atomic really don't dig on the Saints. It's crass, brash, and so over the top as to be thoroughly unrealistic and uninteresting. I'm not saying that Mass Effect is realistic, but at least there's a gritty internal consistency. That can't be said of Saints Row... but damn me if it at least doesn't boast a really great engine. Very possibly the best of its class.

Batman on the other hand – that's more our speed. We like our heroes like we like our coffee: dark and strong. Alternately, dark and slinky, like Catwoman, who was announced as a playable character in the game. Arkham City takes everything that was great about the first game, injects it with embiggening drugs and lets it loose to finish you with a gaming excellence overdose.

Our next pairing at least shares a few shades of darkness, and a certain fear of mutation.

Prototype2 is the sequel to the successful enough to get a sequel Prototype. We liked the first game, but all the tank smashing in the world gets boring after a while. It looks like the next one's a much more focused experience, with a new character who is hell-bent on revenge, in full possession of this memory, and is ex-military to boot. A hard man.

Not nearly as hard as your average Space Marine, though. We got some more hands-on time, this time going up against the forces of chaos, and while this too runs the risk of being repetitive in the longterm, we've loved every

Skyrim is very good, and we will play it a lot – A LOT – but this time it just misses out.

We have to give it to Mass Effect 3, for all the reasons outlined earlier. And if you must know, in one of the sequences, which was a bit from early in the game, we got thoroughly misty. This is the game with the highest stakes, the final moves in a galactic war. It is looking thoroughly epic.





Metro: Last Light was certainly just about the prettiest game we've seen in a long time.

power-armoured, armour of contempt-filled moment of it so far.

Then again, the life-size drop-pod on the stand had us drinking the cool-aid rather early, we must admit!

Best in Show

It's a close fight between the warriors of the Emperor and the Caped Crusader. However, we have to admit – Bats has the edge. Personally, with our love of all things 40k, we'll likely end up playing more Space Marine, but even we can see that Arkham City is going to be something very special.

Little Fluffy Engines Than Can

Pretty much everyone on the show floor talks up how their engine has been optimised, or their textures improved, but for the most part, these are games made for aging console architectures. However, there are four engines that are looking outstanding, and that we think will drive a massive wave of PC upgrading.

Frostbite 2 is an early contender, strutting its stuff with an amazing combination of world detail and expansive capacity. Combined with EA Sports animation systems, it sheer technical excellence. In all honesty, the only other engine that comes close is Metro's. There is simply no one doing this degree of environmental detail in gaming today, but it is lacking the animation power and wide destructive adaptability of Frostbite. On the small-scale, though, it's amazing. Its cloth and material animation is almost lifelike, and destruction of things like small crates, fire that flows and burns across surfaces is unmatched.

Now, Idtech is interesting. We've only seen it on console, so it's hard to really judge this without seeing id's known skill at PC architecture and scaling. To be honest, RAGE is more a victory of level design than anything else, at least for now. The Creation Engine, which powers Skyrim, though, has the serious fo' realz goods. And dragons. Dragons always help.

Best in Show

It's close to a dead heat. In confined, intimate spaces, Metro's engine has it; on a battlefield, Frostbite 2. And it's a little unfair – we played Battlefield, and it left us practically begging to remain at the demo station. In fact, the choice between 20 more minutes of BF3, 20 minutes of Metro, and a full retail copy of Space Marine... we'd choose 20 more minutes inside Frostbite 2's wonderful warspace.

DICE has it by a whisker.

Biggest non-four-legged surprise

Let me tell you about Bastion.

We were walking away from the Warner stand when our PR dude told us, "Hey, there's something you might like." We had a bit of time, so humoured him, and it turned out to be the surprise game of the show.

It's cutesy, it's isometric, it's exactly the kind of game we'd normally walk away from. But it's got this great hook – a gritty, past tense narration of



everything you do. We literally cannot describe what this does to transform the game, but it's a very clever trick.

Oh, and most disappointing thing? The alarming news that, when we asked to see Knights of the Old Republic, to not bother – there's no Australian release date yet. Boo-HISS. Bad dog!

Emerging pet trends

If we had to say one thing about E3... okay, screw that, we have to say two. First up, this is looking like the resurgence of the PC. There were a lot of games on show, most notably BF3, that are going to be smoking on PC. It's never going to overhaul console, but for PC gamers, the next six months is going to be amazing.

More than that, though, it's the year that motion control has started to look mature and interesting. Future Soldier shows that it has a place in a hardcore shooter, if you think outside of the box, Bioware's delivered subtle voice control in Mass Effect 3 (assuming we ever get that in Australia), and Microsoft wowed crowds with some stunning 3D artistic apps which were nothing less than stunning. Hell, even the now-standard crop of 'games designed to make you and your friends look stupid' seemed more interesting.

The Kinect could be worth looking into a bit more now... and you never heard us say that!

E DH



STARCRRAFT II

HEART OF THE SWARM

Atomic ventured over to Blizzard Entertainment for a preview of Heart of the Swarm, the upcoming expansion for Starcraft II. Dave Jansen was on hand to play through the build and sit down with Lead Writer, Brian Kindregan and Production Director Chris Sigaty to discuss the finer points of story and design.

Stepping onto the Blizzard campus in Irvine California you get a sense that this is the epicentre of some of the most innovative and impressive gaming franchises ever made. From the massive Orc statue that adorns the courtyard to the model building club and comic book library, Blizzard pushes its staff to embrace their inner geek.

On the day of our visit, only two missions from Heart of the Swarm were available to play but they definitely gave us an insight into where the title is headed and provided a detailed look at new level mechanics, the unfolding story and the many ways that players will be able to customise the Swarm to fit their play style.

Since we last saw Kerrigan

We were told the missions we played were about four missions into the overall story of Heart of the Swarm, specifically chosen so as to not ruin the story. From what we can deduce, since the end of Wings of Liberty, for some reason, Sarah Kerrigan is trying to regain control of the Zerg. Naturally, she is holding a grudge against Mengsk and intends to use the Zerg

to take him on. However, she is no longer the Queen of Blades, so retaking control will require a great deal of effort.

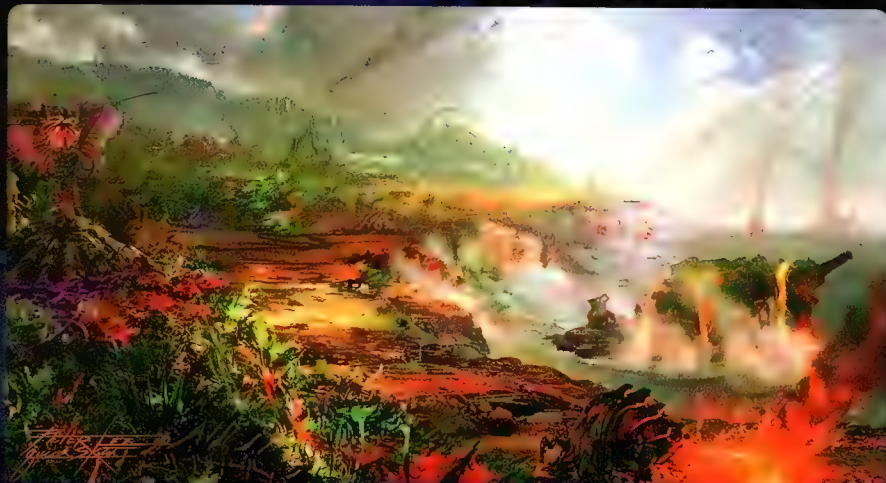
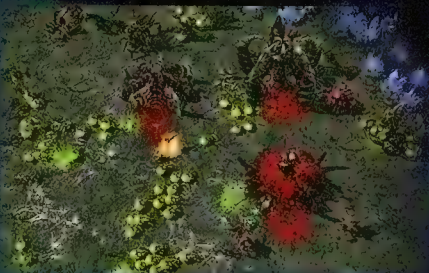
Lead Writer Brian Kindregan was obviously light on story specifics but stressed that Heart of the Swarm is not only the story of the Zerg but also the story of Kerrigan as the two are always going to be intertwined.

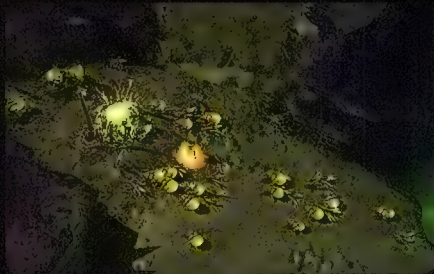
"One of the defining features of the Zerg is that they never sit still, they are constantly changing, evolving and becoming something new. You can never really know what they are, you can only get a snap shot of what they are right now and the same is actually true of Kerrigan," he said. "Back in the days when she was an assassin for the confederacy, she would have her mind wiped after every mission so she was in this constant state of change and flux. Obviously she went through even more transformations later so

those two – that race and that character – seem to fit together really well. There was never any doubt in my mind that she was not done with the Zerg and they were not done with her."

"We've got this intriguing thing going where she appears human but she has the Zerg dreadlocks and she is commanding Zerg forces in the field," he continued. "Despite being a powerful psionic when she was a human assassin, she was never able to do anything like that so clearly not all is as it seems here. For whatever reason, she is trying to regain control of the Swarm and not all of the Zerg accept her. They don't recognise her as the former Queen of Blades so there is some political intrigue there."

He also let us know that both Raynor and Zeratul will appear in the Heart of the Swarm campaign. He went into a little more detail about Zeratul, saying "He is definitely a guy who knows





more about what is going on than everyone else. While Jim was off drinking and Kerrigan was off as the Queen of Blades plotting the destruction of everyone else, Zeratul was flying around the galaxy trying to learn as much as he could about the deeper powers at work and events that had been unfolding for a long time. Whenever he shows up there is an excellent chance that he is going to drop some sort of a bomb."

Char and Kaldir

The mission structure of Heart of the Swarm is based around planets that, as Kerrigan, you visit and conquer with three missions on each planet. Brian informed us that currently they are sitting at around 20 missions although that could very well change by the time they ship.

First you choose which planet to travel to, leading to a mission select screen set on the surface of that world. On this screen are Kerrigan and two new characters – Izsha, your advisor, and Abathur who manages the evolution of your swarm. From there you can select Kerrigan to upgrade her powers, Abathur to upgrade your units or Izsha for story elements. The background environment also changes depending on your progress in conquering the planet.

The first mission we looked at was set on Char, where you have to defeat a Hive Queen named Za'gara. She is attempting to collect eggs to spawn an army to oppose you. The objective is to collect 100 eggs before she does and, along the way, also hatch Banelings to help you achieve your goal.



The background of each set updates dynamically between missions.

The mission structure of Heart of the Swarm is based around planets that, as Kerrigan, you visit and conquer, with three missions on each...

Each time you take out Za'gara, she burrows and starts back at her base so it is a good idea to try and push her back as often as possible. There are plenty of Zerg under her control, too, so you will have your work cut out for you. This mission was fairly simple to understand and was particularly fun once you get your army of 100 Banelings and obliterate Za'gara's base.

The next mission is on the ice world of Kaldir, where you attempt to find another Queen that needs to be defeated. However, soon after landing you find the Queen dead at the hands of the Protoss, who then must be destroyed before they can call for reinforcements. To do this you need to take out the three communication spires

spread around the map within 15 minutes. This map also introduces a mechanic similar to the lava flood level seen in Wings of Liberty.

Periodically, the whole map is affected by a deep freeze. At first, your units are frozen in place but after acquiring DNA from the native yeti, Abathur evolves them to be immune to it. The Protoss are not immune and are forced to use their shields during a deep freeze, leaving them vulnerable to attack. This makes timing when to take on Protoss forces essential to your success. The side mission here is to also kill two Yeti Matriachs to gain extra resources for upgrading your units. This was a fun mission to play; the time limit meant you couldn't waste any time building your army and you needed to take advantage of the flash freezes to efficiently assault the Protoss if you wanted to get the side missions done too.

Kerrigan and Battle Focus

In Heart of the Swarm, Kerrigan will be on the battlefield as a hero unit for nearly every mission.



Each battle focus has a different set of abilities.

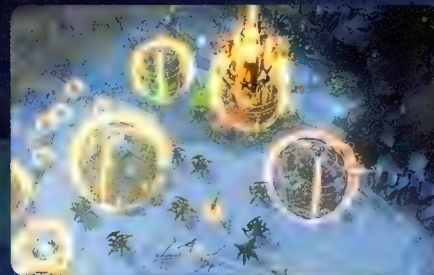




Blizzard has previously spoken of adding RPG elements to the expansion and it is in how you upgrade Kerrigan's abilities that these elements are seen. She has stats which can be increased by acquiring certain objects in particular missions, but she also has multiple talent trees,

called Battle Focus.

The build we played had only two Battle Focus trees, with placeholders for two more, but we were told that this is all very much in flux and there could well be more than four before the game ships. As you play through the missions



you unlock more abilities and more focus trees, which you can switch between according to how you want to tackle a mission; the two we saw were the Spec Ops and Corruption trees. In Spec Ops, Kerrigan was able to create a second version of herself which allows her to take hits for half her normal damage, and she also had an area of effect psionic damage ability. In the Corruption tree, she also had an area of effect ability in which her second talent was able to spawn two Broodlings when killing a targeted enemy unit.

This is a fun system that will make for some interesting choices as you progress through the campaign but we also found it made Kerrigan quite overpowered as well. That being said, the difficulty level of the missions we played was fixed at normal so she may not be quite so over-the-top at harder difficulties.

Zergling

Metabolic Boost – Zergling move speed increased by 33% - one Mutagen

Posthumous Mitosis – Zergling have a 20% chance to spawn two Broodlings on death

Rapid Genesis – Zerglings train instantly

EVOLUTION PATHS

Swarmling – Hatches in group of three

– Third Swarmling has no mineral cost

Raptor – Leaps to close with the enemy units

– Has 10 Additional Life

For Banelings, we found that the Splitterling was of more use because it gave each unit a little more longevity and therefore more destructive potential. The only caveat would be that due to the easy difficulty level, we were never really pushed for resources, always tending to have far more than we needed. It is possible that when resources are tight, evolving your Banelings into Gorgelings will be highly valuable instead.

Swarm Evolution

Since the Zerg are a constantly evolving and mutating race, the units you play in Heart of the Swarm will not only receive upgrades but will also be able to evolve as well. Using a resource known as Mutagen, you are able to upgrade a unit with three possible abilities. Once you have purchased at least two of the three upgrades for a unit type, you are then able to choose one of two evolution paths. The evolved version looks



Baneling

Viscous Discharge – Baneling slows move speed of all units hit for a short period of time

Centrifugal Hooks – Baneling move speed increased by 25%

Rupture – Baneling splash radius increased by 25%

EVOLUTION PATHS

Splitting – Splits into two smaller Banelings on death
– Split occurs twice

Gorgeling – Reduces killed units and structures to collectable resources

With enough Roaches we could easily overpower the missions we played but again, the difficulty level was on the lowest setting. The evolution paths of the Roach are highly dependent on how you play. If you are all about brute force, massive waves of Leeches would be very hard to kill but at the same time, having a smaller force of Prowlers moving while burrowed can allow for highly effective tactical strikes.



...the units you play in Heart of the Swarm will not only receive upgrades but will also be able to evolve as well.

different on the battlefield, has specific abilities and is a permanent upgrade.

According to Chris Sigaty, the design team are making sure that no matter what decision you make when choosing upgrades, you won't paint yourself into a corner making it impossible to progress.

"If you invested in Zerglings and you go to a mission where it is largely air and you haven't done anything on an air units, that's generally okay," he said. "You will still be able to get through the mission, especially because of what Kerrigan can bring to the battlefield. We are currently intending to not allow you to go back

on that so you have evolved the swarm the way you have evolved it."

During the preview we were given access to three types of units: the Zergling, Baneling and Roach. Since we only had two missions to run through, our access to Mutagen was limited but we ran through the missions as many times as we could and tested out the different evolved versions of each unit.

With Zerglings, the Swarming was the easy choice on these missions, especially when you choose Rapid Genesis as well. It allows you to instantly spawn three units for every larva. The Raptor had very limited use on the maps we

played through, so it was hard to see if their leap ability would be of any use. According to Chris, they can leap onto buildings and over objects: so perhaps their use becomes more obvious in later levels.

Chris Sigaty confirmed that Heart of the Swarm is intended to be released as an expansion set at expansion pricing and it will be required to own Wings of Liberty in order to play it. He also stated that they are still working on the previously announced Marketplace feature and are hoping to have it available by the time the expansion lands. Finally, the mod and map making community will be happy to know they are looking at increasing the 50MB file size limit for custom maps at some point in the future.

Roach

Chitinous plating – Roach gains +1 armor

Bile Ducts – Roach gains +2 damage

Organic Carapace – Roach regenerates life more quickly both while burrowed and unburrowed

EVOLUTION PATHS

Prowler – Can move while burrowed

Leech – Gains 10 life per kill (up to +60 max life)

– Heals more rapidly while burrowed





Cities in Motion

Or more accurately, Europe in stuttery Motion.

The art of shuffling people around cities has been a staple of videogame simulations for decades, from the humble days of DOS and smash-hits like SimCity or Transport Tycoon, to more recent titles like SimCity 4 and Cities XL. Cities in Motion is well and truly intended for the modern age and, unlike the genre's first sprite-heavy 8-bit games, CiM is rendered in an engine that can produce antialiased, high dynamic range frames that portray cities in swathes of visual splendour. No simulation game is worth its salt without providing some measure of accuracy and fun, so we whipped out our sim-o-meter and got to work.

Movin' the peeps

The game begins with a simple tutorial, which describes the basic tools needed to get your city going. Movement around the city is done with the WASD keys, and 8-point rotation of the camera can be manipulated with the arrow keys. The scrollwheel allows a zoom range that shows individual citizens and vehicles at an oblique angle, or a more traditional top-down view. Oddly this top-down view doesn't get particularly high above the city of choice, resulting in almost any action requiring a lot of camera panning.

Every network begins with a simple route, which is easily created by the placement of stops or stations that each have an area of effect over the surrounding buildings; this dictates how many people will use the stop. After the route is pinned out the Line panel is opened and stops are linked together, and

vehicles purchased then assigned to the route. Unlike other games, depots are not needed for vehicle purchases; any vehicles not assigned to a route will be held in a virtual depot until they're needed. Eventually passengers arrive at the stops, and if the route is somewhere people actually want to travel, people will begin to crowd the stops and get unhappy.

There are three ways to prevent passengers from becoming unhappy: upgrade stops to have additional facilities, add additional vehicles to the routes to lessen waiting times, or reduce ticket prices. The last option is very often a poor

choice. The happier the passengers are, the better; more passengers will flock to the routes you've created and money will start to trickle in.

Buses alone are hardly enough to keep a busy city flowing, and once into the campaign proper we very sporadically used them. Instead, the transport of people around the city essentially boils down to building a central metro system, with trams feeding passengers to the metro, and buses for the outskirts of the city. Though there are expanses of water that can be crossed by so-called waterbuses (ferries), and helicopters that can cross any





distance, these two vehicle types are often unprofitable and are marred by achingly long travel times, leading to passengers becoming unhappy and ultimately reducing profits. Five route types may sound limiting but there is just enough variety in vehicle types to make decisions interesting, with each vehicle differing in passenger capacity, price, resource consumption and likelihood of breakdown.

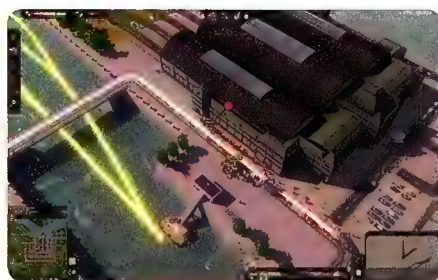
We found the process of covering a city quite engaging and relaxing, aided by the laid-back soundtrack and simple sound effects. But the experience of actually running a network was less than perfect.

Shonky vehicles

Though CiM drills down into budgeting and upkeep of vehicles, as well as providing a measure of how reliable vehicles are, in practice it's a nightmare actually keeping the system flowing properly as neither of these features actually do anything at all. It's both guaranteed and unavoidable that a vehicle will break down

every minute or two once a network is up and running; an event that spews all that vehicle's passengers out into the network and gives each an extreme case of the shits. Not only does this reduce your overall profitability and make having a good reputation something of a fleeting dream, but the game also automatically deducts a fee to repair the broken vehicles, again hurting profitability.

Each of the four cities available in the game, described as "the world's greatest cities" by the developers, are separate entities to the player. Available to play are Amsterdam, Berlin, Helsinki and Vienna, which each can be played in from 1920-2020. We say played *in* and not *with* for a reason: the player has no effect on how the city changes over time! No matter the coverage of services, the price of the service, or the placement of routes, the proportion of private cars on the road will remain static. These cars plug up routes and most notably affect tram lines, and it's disappointing to have the game tell you you're doing great with increasing



public transport usage while seeing no actual results.

The campaign presents different scenarios in each of the cities that span different time periods, and though most are the usual "make x profit a month by 19xx" or "cover 70% of the city", some are more challenging, such as the scenario that insists you avoid all metro use. However the requirements to actually pass these scenarios are quite fallible; in every circumstance you're allowed to merely bypass what the game is asking you to do and go the central metro, tram and bus route. Throughout the scenarios random objectives occur that ask you to link completely arbitrary points together for money, which can be done easily with a throwaway line that is demolished immediately afterwards to recoup most of the cost. As each city follows the same growth plan the central roads and buildings remain the same throughout the playable period, and eventually it became a chore to link up the same routes time and time again.

Though the engine is modern in appearance it is horribly marred by performance issues; on our gaming rig it was commonly running at 20fps, or less if any antialiasing was applied or anything busy occurred on-screen. We're nitpicking here, but typos are also noticeable in descriptions and scenarios. These issues can be ignored by diehard transport sim fans, and for those few there might be some interest in CiM. Everyone else will soon find themselves buried underneath the mountain of flaws that tarnish this otherwise solid sim. **JR**



PC

Developer Colossal Order Ltd.
Publisher Paradox Interactive
Website www.citiesinmotion.com

Gameplay

Breaks no new ground, and the limited variety will ultimately become a grind.

60

Graphics

Shiny and attractive when paused; jerky and slow when running.

35

Sound

Nice soundtrack and a good variety of sounds provide auditory interest.

80

Overall

A solid premise hindered by poor execution. Almost certainly won't leave you happy.

55%



Yes, you can change graphics settings before the first race!

In an industry where franchises tend to be driven into the ground with relentless annual releases the Colin McRae rally series stands out. Dirt 3 is the eighth game in the franchise and the first to drop the Colin McRae name, but it is very much a member of the franchise.

Like the other titles in the Dirt series it is the core gameplay that defines the game. Codemasters has finely balanced arcade racing and simulation to deliver a driving experience that is first and foremost about having fun. This takes place over a variety of events and seasons which include the heaviest dose of rally in a while alongside the usual novelty events like RallyX and Trailblazer.

The big addition to the game this time around is Gymkhana, which is effectively a stunt driving

competition. While progression through the first competitions does require some Gymkhana events, these are quite forgiving and eventually unlock the Gymkhana track set in London's Battersea power plant. This is separate from the main series of competitions and involves somewhat free roaming gameplay in which you complete a series of challenges ranging from knocking down certain items to having your drifting abilities tested.

The big fear is that such a component will take over the game, but thankfully if Rally is what you're looking for, then you can safely ignore Gymkhana after the first challenge. Otherwise it provides an interesting diversion from the racing focus seen in the other events in the game.

Rally has a strong presence

It doesn't take long to realise that Codemasters has put a big focus back on Rally in Dirt 3 as well (even though the game is gasping for more varied tracks). Not only is there the usual assortment of modern Rally cars, there are also cars from the 60s onwards, as well as the infamous Group B monsters. Events usually give you a choice of a few different eras, and as you progress through the game and build your reputation, more and more teams will approach you, which gives you access to more cars and liveries.

The driving experience is where Dirt 3 really shines. You can tweak up the cars and difficulty levels to match your skill, from autobraking and





other handholding measures at casual level to a more realistic driving experience at expert. Along the way you can tweak stuff like the dynamic racing line and the level of stability of the car. This wide range of settings means that the gameplay itself is suitable for a wide range of player skill and experience levels – just be ready to spend a bit of time tweaking until you are happy with the driving model.

This driving model works hand in hand with the graphics engine to deliver some great gameplay. The in-game weather is particularly challenging, with snowfalls playing a big part in some of the races, for example. The game has full DirectX 11 support on the PC, and looks absolutely stunning with everything cranked up and running at high framerates. While this

is certainly a cross platform game, AMD is pushing the DX11 side of it, and it's one of the few titles to bear the company's Gaming Evolved branding.

Again with the youtube

One of the most polarising aspects of Dirt 2 was the presentation, on PC especially. The game was notorious for not letting you access any setting until AFTER the first race, something thankfully gone from Dirt 3. Also gone is the use of your trailer as the in-game menu, in its place is a more traditional series of race events and challenges that are unlocked as you earn reputation. While this shift away from waste of time menus is welcome, the cheery Bro-fullness of the commentary hasn't been diminished.

After every race you'll have one of three commentators expounding on your awesomeness. Even the most mediocre of performances will be met with something along the lines of 'Yo, that was wicked. You should upload it to Youtube'. In fact, the sheer relentlessness of the push to upload footage gets really annoying really fast, to the point where the mere term Youtube makes one cringe. If your cohorts pushed you to drink a



Coke or eat some Doritos after every run there would be an anti-advertising backlash but apparently incessantly pushing Youtube is fine.

Finishing up

In many ways Dirt 3 is exactly what we expected, a natural evolution of the Colin McRae Rally series. It is a game which tries to deliver on various levels, and the single player at least manages to deftly balance Rally with Gymkhana and other more novelty events. Multiplayer is a little weirder, with gameplay types designed as party games alongside what is traditionally seen in Rally titles. These include things like 'zombie' mode, where players try to ram each other to 'infect' competitors and a capture the flag based gametype.

With Dirt 3 Codemasters has tried to please a wide range of players and by and large it has delivered. We do wish that there was a bit more variety in the Rally tracks, and thoroughly loathe the constant push to Youtube, but we did have a blast playing Dirt 3 and are likely to keep returning to it when we need a hit of Rally action. Another solid release in one of the more reliable game franchises out there. **JG**



PC, Xbox 360 and PS3 (reviewed on PC)

Developer Codemasters
Publisher Codemasters
Website www.dirt3game.com

Gameplay

Caters for a wide skill range.

85

Graphics

DX11 in all its stunning glory.

90

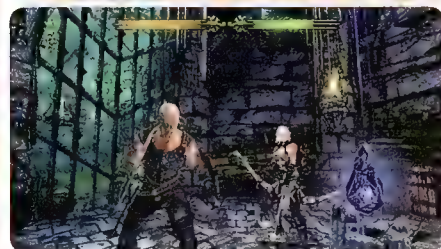
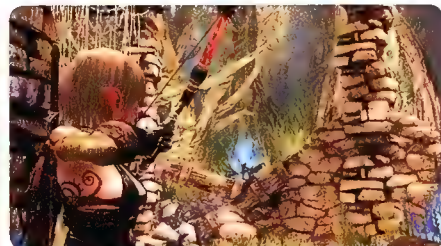
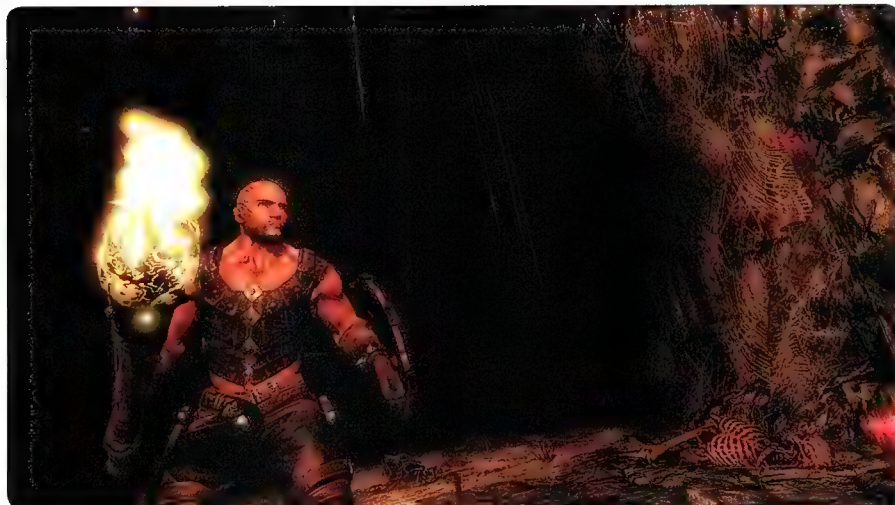
Sound

Crunchy, roary and satisfyingly noisy.

85

Overall
Another solid entry in a venerable franchise.

87%



Hunted: The Demon's Forge

Another console port that leaves something to be desired.

What is it? Some sort of computer game?" "In a sense, except it uses the most powerful processor known to man – the human mind." (The IT Crowd Season 4, episode 1)

Hunted: The Demon's Forge can be summed up easily by its genre: cooperative 3rd-person action RPG. But, unlike the above quote, the imagination and inspiration behind TDF does not propel it to new heights or flights of fancy.

A lengthy pre-rendered opening kicks off the show, highlighting battles and a kingdom under siege, with very explanation. Eventually, it ends and the tutorial begins; dropping you first in the body of Caddoc; a sword-swinging, crossbow-wielding human warrior. Then suddenly you're dumped into the second of TDF's playable characters, the bow-wielding elf E'lara. It all

feels very jarring and nonsensical, as the game proceeds to awkwardly explain some – but not all – of the controls.

A wizard did it

The world's most linear and bland 'prologue' level is next, and we have as much fun as your average garden snake would if it attempted to swallow a whole pool noodle. It's not until the end of this lengthy and forgettable prologue that we meet Seraphine, a bodyless soul encapsulated inside a magical skull called the 'Deathstone'. She's voiced by Lucy Lawless of Xena fame, and opens up the most interesting weapons in the game.

Both Caddoc and E'lara have three physical and three magical attack spells to cast that must be purchased through Seraphine. These are tiered, with further improvements in power and range coming at the cost of crystals left behind by felled enemies. They're tremendously powerful against large groups, but are balanced out by a lack of mana.

Although we'd prefer to play with a friend (see left), we left the AI to take control of our counterpart. For the most part the AI is competent, rarely straying nor running far ahead and casting the occasional spell, though it did manage to get stuck against a wall every half an hour or so.

The game becomes infinitely more enjoyable once past the terrible prologue, with widely open areas connected by co-op checkpoints. Checkpoints consist of thin corridors, heavy doors or narrow beams, and can only be traversed if both characters are present. These checkpoints are annoyingly frequent – and made worse by dialogue that plays at every one. You'll get sick of phrases like "There sure are a lot of doors" and "I wonder how anyone gets around alone" very quickly.

We gave Caddoc a try; his playstyle was vaguely reminiscent of 3rd-person Oblivion combat, involving holding up a shield and waiting for the enemy to finish attacking before we get our turn to hit them a few times until they fall over and disappear 30 seconds later.

We preferred E'lara's playstyle, which predominantly involves a Gears of War-style cover mechanic and has a high focus on stop-and-pop shooting – unheard of in a fantasy game so far. It works surprisingly well, though aim assist is enabled by default and makes headshots harder than they should be.

Again, from different angles.

TDF had a rocky start, interspersed with interesting moments and mechanics, but is ultimately let down by a lack of variety and a missing sense of fantasy. It's definitely one to avoid at full price. (5) JR

PC, Xbox360, PS3 (reviewed on PC)

Developer inXile Entertainment
Publisher Bethesda Softworks
Website www.huntedthegame.com

Gameplay

Repetitive and linear with infrequent points of interest. Broken co-op play.

Graphics

Unreal 3 tech gives a functional, if not exceptional world.

Sound

Unobtrusive music and nice effects. Dialogue is a bit daffy.

Overall

Clearly a console port, though it has rare moments of brilliance.

54%



It has co-op!

It just doesn't work on PC.

Though TDF is thankfully not weighed down by any GFWL nonsense, we could not get co-operative working at all – an issue that others on the PC platform have faced. We attempted to create a manual Windows firewall exception and connect via Hamachi, and neither solution worked. While a patch may eventually be released for PC it's yet another sign that developers aren't paying enough attention to their so-called finished products.





Infamous 2

Forget Phelps – McGrath is the only Cole that feels truly electric.

The original Infamous game – released way back in the dim dark ages of 2009 – was a surprise hit, coming essentially out of the blue as a PS3 exclusive and a fresh take on the concept of the reluctant hero. People are usually cautious about new IP, but the game was so universally loved that it was destined for franchise-hood. But sequels to good games can be tricky beasts, often held to far higher standards than other games – just ask BioShock 2.

Thankfully, Infamous 2 is a very worthy successor to the original title, with enough new mechanics to make sure it feels fresh, but without the sense of gameplay elements that worked perfectly being 'fixed' for the sake of it.

Welcome to New Marais

Infamous 2 kicks off with the almost-clichéd 'beginning boss fight' where Cole battles the prophesied Beast from the first game, before having his rear firmly handed to him and his powers severely reduced (c.f. God of War and Darksiders to name just two examples of this). While it may seem initially frustrating – especially for those who have played the first game and slowly built a gormless bike courier into an electrical powerhouse – it actually works well in terms of the gameplay and plot elements for the sequel. In the wake of his defeat, Cole and

Zeke relocate from Empire City to New Marais (New Orleans in a pair of fake glasses and a moustache), where Cole slowly prepares for Round Two.

Unsurprisingly, this preparation will involve large amounts of climbing, blasting baddies, making moral decisions and collecting blast shards as Cole slowly repowers. It's this sense of familiarity that keeps Infamous 2 fun – you'll need to repower darkened areas of the city, help (or hinder, depending on your moral compass) the populace and, yes, scale buildings and grind cables to your heart's content. It helps that New Marais is a beautifully realised city – from the main tourist town area, through to the Flood Town slums and even the Swamplands, it's stunningly designed and the sheer act of exploration is enormously enjoyable.

Getting zapped

Of course, Cole is nothing without his electrical abilities. While many old favourites in the power department make a return, Cole also gets access to an extended range of powers and more emphasis is put into the different powers available based on his karma. Powers can be unlocked with experience points, but for some you'll need to meet the stunt pre-requisites (x number of headshots, y number of enemies hit in midflight etc) or for others you'll need to be good or evil enough. There's also a mid-game story point that opens up even more options (which would be a little spoilerific to mention here) It all makes for a very varied Cole by the end of the game.

Speaking of moral choices, while the karmic options early on can still be a little fatuous in a 'pat the puppy or kick the puppy' kind of way, later narrative elements add a clever complexity

to these, giving you genuine pause to really think through the consequences. It's not Sophie's Choice by any means, but it certainly gives the game more depth than before.

Of course, Infamous 2 isn't perfect – controlling Cole can still be a lesson in frustration at times, especially during missions when the clock is running and he's rushing in every direction except the one you want. His tendency to grab any available surface can also ruin well-timed Thunder Drops. Overwhelming enemy numbers are also a niggle at times, although the game usually ameliorates this by having two factions fighting each other and Cole mopping up the survivors. Civilian casualties still count as bad karma as well, meaning some of Cole's better AoE powers need to be reigned in if you're taking the good path on the moral road.

But all in all, Infamous 2 is a great game and a worthy successor to the original. Cole himself is a far more likeable character and it's easy to get caught up both in the story and the gameplay. Solid writing, good characterisation and great game mechanics all combine to make Infamous 2 a highly enjoyable (and detailed) romp. (E) NH

PS3

Developer Sucker Punch
Publisher SCEA
Website www.infamous2thegame.com

Gameplay
Enormously fun, well designed and cleverly written.

93

Graphics
Bright, detailed and as good as anything on the PS3.

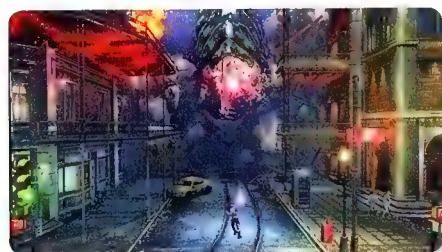
90

Sound
Great voice talent, excellent power effects.

94

Overall
An excellent title that's almost worth buying a PS3 for, if you don't have one.

92%





The great man finally gets his return, and the world is a far poorer place for it.

Man, where to start...

Normally we like to pull out a single outstanding or spectacularly bad point about a game and focus on that, before leaving that aside and going through the game's other high and/or lowpoints, then triumphantly returning to our original point like a magician with a rabbit.

However, that's hard with Duke Nukem Forever. You see, it's so monumentally and intrinsically bad that it's impossible to know where to begin. It's embarrassment of riches – except the riches are all poo jokes, crappy textures and decade-old gameplay elements.

The theory

In fact, let's step back from the game for a moment, and look at how it's actually come to

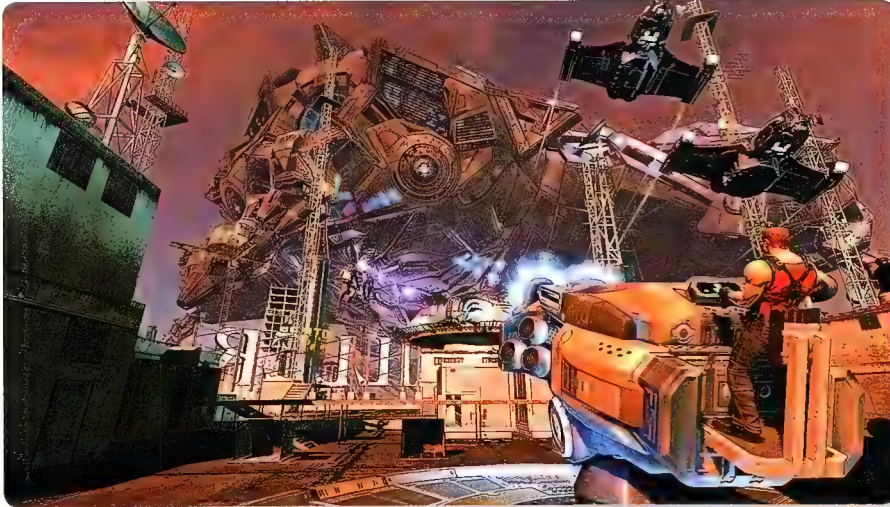
market. When 3D Realms, the original developer of the game, collapsed under the weight of numerous vapourware of the year awards, it was assumed the game was dead, possibly never even properly started. However, a few years ago Randy Pitchford's Gearbox Software announced that, like some Fedora-ed adventurer questing for gold, it had kicked over 3D Realms' corpse and found it was hiding a near-complete Duke Nukem Forever. Calloo Callay!

Of course, this so-called great game still took years to come to market, accompanied all the while by claims of just how great it was going to be, and how awesome it would be to see Duke back amongst the gaming pantheon where he belonged. Up to launch, the hype became particularly intense – pole-dancers at

preview events, trips to Las Vegas for hands-on sessions, endless trailers...

The thing with DNF is that it already had a lot to live up to. We're talking a game with a decade-plus development cycle here, and a huge reputation to live up to, to boot. You could have quietly released the game into stores and Steam with nary an ad, and people would still be quivering with excitement to see what the game was actually like. But when you add this level of hype to that pre-existing expectation, you start to get people really revved up. It's a little like Homefront, a game that actually suffered by comparison because of the serious hype that THQ pumped into the market before its release, by just not being able to live up to the promises being made.





Except, at least with Homefront, there were something things that were actually good. Our only explanation for the sad mess that is DNF is that Randy Pitchford had a stealthy aneurism at some point in the last few years, and is now convinced that whatever the last thing he saw on his monitor would make a great game (see also: Brothers in Arms: Furious 4 and Aliens: Colonial Marines).

The game

What a mess. It plays exactly like you might expect a game that effectively killed its parent company might play. It looks and sounds much the same. From the early levels which effectively set up Duke as the new God of a world saved by him back in the first game's timeline, to the

middle levels which contain some of the most horrifically misogynistic pap we've ever had the misfortune to play through to... well, we're more than happy to be honest here, we simply quit the game at this point. There's only so many exploding women and rape jokes we can handle.

In fact, none of the humour made us laugh. Most of it was toilet-grade, or so referential to pop and gaming culture as to be rendered dated almost immediately. And don't get us started on the sad nature of the highly linear action, padded level design, and crawlingly... slow... loading... times...

In terms of graphics, things aren't much better, and the game literally plays like something that is 13 years old in terms of ballistics and weapon mechanics. Note to Gearbox – there's a reason no-one makes games like this anymore! Multiplayer might have had the most to gain from gamers yearning for kinder, simpler deathmatches, but it too is a buggy, ugly, boring morass of fail.

The why

There's an interesting lesson to be learnt here. Duke was a great character back in the day, but look at who he was competing with in other

Game fail + PR fail = EPIC FAIL

Many online outlets came out with their similarly negative reviews of Duke, but one in particular – Ars Technica (www.arstechnica.com) – earned the extreme ire of 2K Games' PR company. We quote from their original story here:

The press and PR relationship may sometimes be strained, but it's rarely adversarial.

That is, until the Redner Group's official Twitter account posted something you almost never see: an open threat stating that outlets who reviewed Duke Nukem Forever poorly may not receive review copies of games in the future. Anyone who has done this job for any amount of time has suffered through a dry spell after giving a publisher a bad review, but this is the first time the threat of a blacklist has been made public.

Game reviewing should not be a dirty business, but it's things like this that hurt everyone involved. Bravo for Ars for bringing it to light and taking a stand.

FPS games – no one. Most game antagonist back then were pretty faceless, so all Duke had to do was introduce working mirrors – so you could literally see yourself in the world – and a distinct and unique voice, and you had a memorable character. However, for those who remember the original, have a serious think back – Duke really didn't talk all that much. His one-liners were well-timed zingers, not tired catchphrases.

He was an iconoclast, not an icon himself.

In a lot of fundamental ways, Duke Nukem Forever and the long string of developers who have helped keep it staggering toward release forgot what made the first game good. (5) **DH**

PC, Xbox 360 and PS3 (reviewed on PC)

Developer 3D Realms, Gearbox Software
Publisher 2K Games
Website www.dukenukem.com

Gameplay
Repetitive, lame and ultimately unsatisfying.

56

Graphics
Overly shiny, and dated.

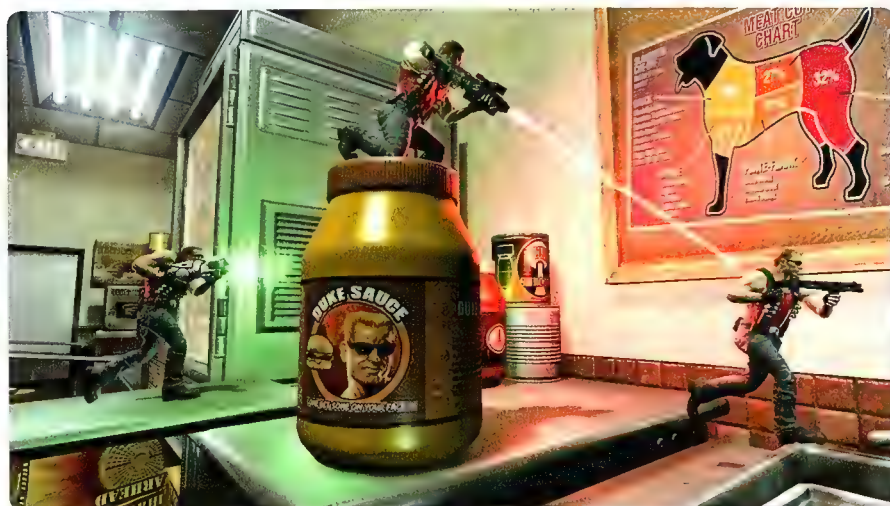
48

Sound
Duke sounds like he's asleep. You'll wish you were.

36

Overall
Forever feels like an eternity.

48%





Absolutely no Uwe Boll was involved in the making of this game.

Okay, we got our union-standard Uwe Boll joke out of the way early, so now we can focus on the game, and nothing but the game. But we're also kind of using this review as a test-case for a slightly new reviewing style, or at the least a new index of whether or not we really rate a game.

And it's a simple one – we can see the goodness in *Dungeon Siege III*, but after a round of preview playing sessions, and now our review time... we're just finding it really hard to stick with it. Right up front, that's not a great indicator of game success right there. And it's not as if we're not into the basic click-kill-accessorise premise of the game, either. We played many long hours

of the original *Dungeon Siege* (though not so many hours of II), and similar games leave us with a sense of click-kill-accessorise joy.

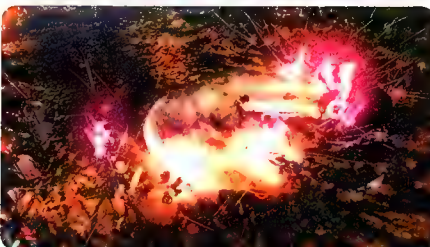
So what's the deal?

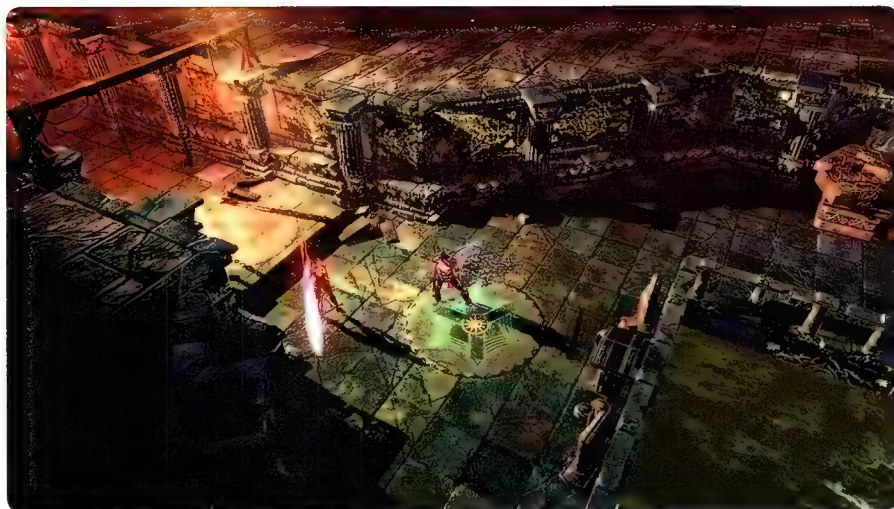
In the beginning...

I'll say this for *Dungeon Siege III* – it has a great setting and artistic style to it. The world of Ehb has advanced to a gunpowder age since last we saw it, and one of the four playable characters has pistols and rifles as their main weapons. The clothing styles are more 17th century than medieval, too, and you get a rich sense of a vibrant, persistent world undergoing a steady march through history.

The sketch-style interstitial sequences, with accompanying gravelly-voiced narrator, do a good job of adding to the game's setting and sense of pathos, too. However, it's also here that the game starts to get a little too top-heavy – you're lost almost instantly in a world of names and places that, unless you're a really keen fan of the series, are more or less meaningless. Soon enough, though, it's down to character selection and the meat of the game.

The characters on offer are probably the strongest part of the game, and a clear indicator of just how integral to the game co-op play is. You've got a melee specialist, a mixed melee ranged character, an area-of-effect mage, and





a directly ranged character to round things out. All are somehow linked to the plot – a quest to defeat the evil (or, at least, very focused on results) Jeyne Kassinder and restore the power of the fabled 10th Legion – by being relatives or wards of powerful legionnaires.

The selection of characters is great, though limiting. Choose the swordsman Lucas, for instance, and you're pretty much locked into only ever being a swordsman. Given the game continually drops weapons and loot for other characters, this might seem a little frustrating. Each character has two stances they can use and a number of powers available in each. For instance, Lucas has a stance designed to let him handle single, tougher enemies, and one for larger numbers of lesser badguys. These are based around different weapon combos, though we have to say, it's like the DSIII devs have never actually thought about how swords work. Lucas uses a sword and shield on lone enemies, and a twohander for masses of enemies – surely the heavier hitting power of the twohander is more appropriate to big tough monsters, and the greater protection of a shield more appropriate to mobs.

But perhaps we're bringing too much logic

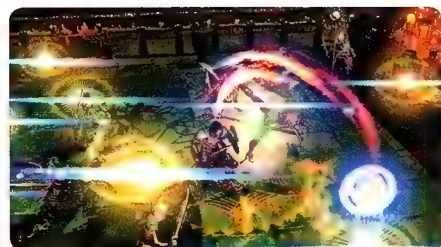
to a rather silly knife fight – this is a game with magic rifles that fire a spray of bullets, after all.

All of these powers work great when you lock them together with a second player, and since everyone has some form of healing ability there's a high degree of tactical challenge on offer. However, DSIII does feel a little empty when you're playing by yourself. There's a great skill system to get to grips with, but this too is a little too top-heavy – there are skills, talents for skills and all manner of things to upgrade, level up and improve, in an array of pretty yet not that informative screens.

Keyboard, mofo, do you get it?

In fact, the number of screens you have to navigate to get around the game's UI is one of our big issues. Just swapping out a sword for a newer Sword of Brevity +5 takes nearly a dozen clicks!

However, our biggest gripe – and we think this is why the game is so annoying to navigate – is just how poor the mouse and keyboard controls are. Seriously, it's possibly the most annoying combination of character and camera



control we've ever had to endure. You can plug in an Xbox controller, and it improves the experience, but to our minds... why release a game on PC that requires extra hardware?! It's classic porting issue, and stark proof that the game was made first for console.

There's a very solid and deep action RPG here, but you've got to be able to come at it the right way. It really is better with a friend, for one thing, and it's certainly not a PC optimised experience. If you can get around these issues, you'll love two-player co-op on a single PC with two controllers – it's a mess of fun. But if you're expecting a game that takes full advantage of the input power of a PC?

This ain't it. **DH**

PC

Developer: Obsidian Entertainment
Publisher: Square Enix
Website: www.dungeonsiege.com

Gameplay
Great action, but porting issues mar the experience.

71

Graphics
Solid, with some colourful spell effects.

81

Sound
Pretty standard clashes and voice work.

76

Overall
Almost a great game, but a lot of work to enjoy.

73%



Metropolis:

Reconstructed and Restored

The most expensive movie of its time gets even longer.

Director Fritz Lang
Distributor Madman Director's Suite

You don't have to be much of a culture buff to have at least heard of Fritz Lang's 1920s silent film, *Metropolis*. At the very least, you will have seen the stills of skyscrapers and multi-lane freeways, which have turned out to be eerily accurate predictions of the future.

Metropolis holds the record for being the most expensive silent film ever made, and watching it is discovering the root of one obscure pop-culture reference after another. It's quite the experience – but we'll get to that.

The story behind this most recent re-release is as follows: way back when, about half an hour of film footage was lost, and the release that most people have been watching since was thought to be all that was left. Then in 2008, someone got their hands on that extra footage, and it has been restored – to a point – and re-inserted into the film.

The result? A two-and-a-half-hour silent film, which is obviously not going to be to everyone's taste.

But that's not to say that you shouldn't watch it.

For those more used to modern-day 'talkies' – namely, most of us – watching a long-form silent film takes some getting used to, especially outside of a cinema setting. We don't often think about how much we rely on sound cues and dialogue to tell us a story, or how they allow us the freedom to get up off the



couch and get a drink without missing any of the story – in a silent film, there's an extra level of concentration required. Looking away, even for a minute or two, means you come back lost. And the sound that there is – the score – feels very over-the-top by talkie standards. We're used to modern scores denoting the 'big' moments in a film, and being barely noticeable at other times – here, the music has to denote everything, so it's big all the way through. As are the visuals, and in particular, the facial expressions, which have to convey many of the things that dialogue would in a talkie. Unless you watch a lot of silent films, all of this takes a good half-hour or more to get used to, which is probably why it's lucky that the pacing is a lot slower and a lot more deliberate than most modern films as well – by the time the story really kicks off, you're familiar enough with the 'language' to actually engage with it.

Once that happens though, *Metropolis* is surprisingly entertaining. The story of a dystopian city whose residents fall into two classes – managers, who live a life of luxury, and workers, who dwell in the depths and keep



atomic MAXIMUM POWER COMPUTING

CULTURE SHORTS

It might be chilly outside down here, but in the US it's summer, which means summer blockbusters – and comic book fans are well catered for this year. The past month has seen the release of the well-received *XMen: First Class* and the far, far less impressive *Green Lantern*, with *Captain America: The First Avenger* still to come. It's movie-going time!

The next season of *Doctor Who* will be screened across 2012 and 2013, which has some commentators worried that the series may be in trouble. We're sure it will never really die, but nor do we want this particular version to go away any time soon. Thankfully, everyone involved seems to be pointing to the split having more to do with the 2013 *Who* 50th Anniversary than ratings, but we do have to ask: how is the Christmas special going to work next year?

the city's machines ticking – and the tensions between the two still resonates, as does that good old theme of religion as an opiate for the masses, and how those in charge can, and do, use that to their advantage. And visually, *Metropolis* is unmissable. The production design is over-the-top, but so very precise. It's as though Lang thought out every single frame – and stylistically it's not out of place among the visual art coming out of Germany between the wars. Some shots veer towards comical, but they are always striking and compelling.

As for the extra footage, it's debatable whether or not it fills out the story in a useful way, or just makes an already difficult (and long) film even more inaccessible. Much of it is just single reaction shots, but it does serve to flesh out plotlines that may have been lacking otherwise.

To be honest, first-timers probably wouldn't lose that much seeking out an older, shorter version to cut their teeth on. This recut might be one for the purists and the die-hard film buffs – but it does have something to offer the rest of us, if we're up to the challenge. **EG**



Overall
Not for everyone, but
ultimately rewarding.

80%

**YOUR FRIENDS ARE HERE.
WHERE ARE YOU?**



ENTER THE RIFT™

WWW.FACEBOOK.COM/RIFTGAME

WWW.QVSOFTWARE.COM.AU



TRION™



Distributed By:



Interactive Entertainment Specialists

EB GAMES

GAME
www.game.com.au

[JB HI-FI]

© 2006-2011 TRION WORLDS, INC., TRION WORLDS, RIFT, TELARA AND THEIR RESPECTIVE LOGOS, ARE TRADEMARKS OR REGISTERED TRADEMARKS OF TRION WORLDS, INC. IN THE U.S AND OTHER COUNTRIES. THE SOFTWARE PLATFORM LOGO (TM AND ©) IEMA 2010. ALL RIGHTS RESERVED.

Carrier Command

This here is the best game ever made. Ever. Ever. Ever.
So says Ben Mansill.

I've been avoiding writing about Carrier Command. When this column started it was the first thing I wanted to write about. Every month when I think about what to write, Carrier Command always pops into my head first. I avoided it simply because it was, to me, the most obvious thing ever to rave about, so doing so felt like cheating.

Now, with E3 reports showing that Bohemia's remake is actually looking like a faithful modern rendition, and not the generic FPS I was terrified it would be, the time has come.

Rainbird's 1988 Carrier Command was the first game I fell in love with. I played the Amiga 500 version. Many games before I really, really liked, but this was the game that signed and sealed my love for games. Good ones. And Carrier Command is exceptional. It's the planet-sized diamond at the heart of the gaming world.

I think that when most people played it for the first time they were confused as hell...

I think it's the best game ever made.

The crazy thing is, it shouldn't actually work. I think that when most people played it for the first time they were confused as hell about exactly what sort of game it was. It fused multiple genres into an overall complexity that was unusually intricate for the era. It was intimidating to play, and discouraging with its immense difficulty. It took me many days to get an inkling of what was required to win, and it's then that the magic rose to the surface.

We talk about 'balance' in games today, well, it's easy to 'balance' opposite unit types in an RTS, quite another to have a game like Carrier Command work harmoniously.

At its heart is a mighty futuristic aircraft carrier. Inside were four Manta attack planes, and four tracked ground vehicles; the Walrus. Each could be outfitted with a variety of weapons or base building modules. Neither was manned, both were driven via remote control from your carrier's command center. They could be set on auto pilot, which was nothing more than staying on a heading. They ate fuel prodigiously. Worse, the radio control range was also poor, and when they were just a few miles from your ship the link was lost and you'd lose them forever. There was no pretence of you physically flying or driving, the whole idea was that you sat in your command room operating them, and the ship's systems.

These systems included supply and inventory mechanics, a fantastic ship repair system where percentage-time of repair was dosed out to damaged systems depending on your priorities. On-board too was a mighty big laser canon

which you'd point and shoot as well.

And this is where it comes together. To do well at Carrier Command you needed to be so totally, perfectly super-efficient it was insane. It was completely absorbing and intensely driving, as the AI carrier had exactly the same set of systems and it operated at ruthlessly no-compromise computer controlled perfection.

These tools you'd use to capture a string of islands. They were all linked with unseen 'pathways', looking much like a galactic constellation of linked dots. Maintaining an uninterrupted supply line was critical, and a huge part of the design genius. You could be rampaging well into enemy territory, but if bad-guy AI took an island that broke the link you were rooted. With only the fuel and weapons on-board at the time, it was then a frantic rush back to re-capture the lost linked island to restore

ongoing and heavily used supplies – during which time the enemy carrier was wreaking further havoc elsewhere across your island chain.

It was very much an ebbing and flowing, push-pull of territorial control. There was no room for careful, conservative turtling, the AI would eat you alive in short order, always taking islands far from your current position, then another right where you were previously operating as you rushed across the sea to re-take the lost island. It was murderously difficult, but musically perfect in its pace and pitch.

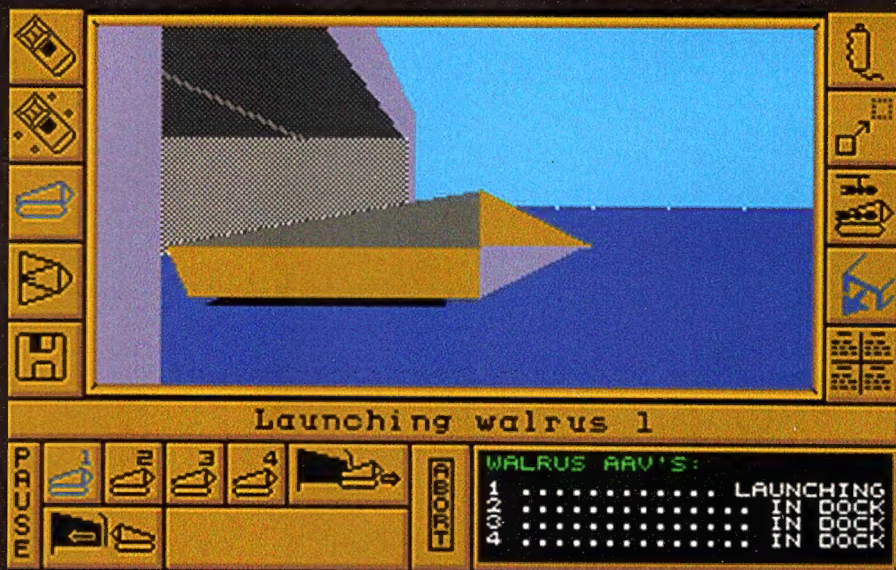
Capping off the design perfection, captured



islands each had a critical job to do in the war effort. After capturing, by destroying the enemy structures and defences, a Walrus was sent in to initiate auto-construction of a friendly base. You'd designate them either Resource (created raw materials for future construction), Factory (made weapons, modules, fuel and vehicles), or Defence (it'd auto-construct gun emplacements and fight its own defence independently). The strategy was to balance it out, so safe and well behind the lines islands would be Resource or Factory, and choke points would be Defence.

The super-perfection extended to second-perfect manoeuvres. For me, I'd swing by islands without stopping, sending a Manta to do the dirty work and simultaneously a Walrus to start a new base, while then heading off at speed for the next island while the battle was still underway. If done right, you'd take the island just as radio range was lost, thereby sacrificing the precious vehicles, but maintaining the pace needed to push forward. Losing a single island meant losing supply, and no replacement vehicles.

The only pity is it came with just one map, when more could have been easily added. It's also quite amazing that there's been nothing like it since. It's accessible now via DOSbox and easy to find, let us hope that Bohemia delivers something with the same magic! 





TIP-Q120U3SI

TransImp®

SATA/IDE TO USB 3.0 ADAPTER

- USB 3.0 INTERFACE
- HOT SWAPPABLE : PLUG & PLAY
- POWER & ACTIVITY LED INDICATOR
- EXTERNAL POWER ADAPTER INCLUDED
- SUPPORTS 2.5"/3.5"/5.25" IDE OR SATA DEVICES



M one Software
inside.

TransImp®

2 PORTS USB 3.0 EXPRESS CARD/34



TIP-PU301CB

- 10 x FASTER THAN USB 2.0
- UP TO 5Gb/s WITH USB 3.0
- MAX. +5V / 900mA OUTPUT
- BACKWARD COMPATIBLE WITH USB 2.0/1.1



TransImp®

SATA TO USB 3.0 HARD DRIVE DOCK



TIP-D180U3-WH

- INSTALL & ACCESS HDD IN SECONDS
- STORAGE BOX DESIGN
- SIMPLE TO USE DESIGN : PLUG & PLAY
- ADD STORAGE TO ANY SYSTEM WITH USB 3.0



M one Software
inside.



TransImp®

REMOVABLE DUAL 2.5" HARD DRIVE RACK



TIP-M200ST-BK

- UP TO 3Gb/s TRANSFER RATE
- ALUMINUM ENCLOSURE DESIGN
- HOT SWAPPABLE : PLUG & PLAY
- DUAL 2.5" SATA HARD DRIVE SLOTS
- EASY INSERTION & REMOVAL OF HARD DRIVE

TransImp®

REMOVABLE HARD DRIVE RACK



TIP-M401ST-BK

- SUPPORTS 3.5" SATA I/II HARD DRIVE
- TEMPERATURE MONITORING
- SECURITY KEY LOCK DESIGN
- FAN FAIL WARNING ALARM
- FRONT COOLING VENT
- PLUG & PLAY
- LCD DISPLAY

ASTROC®

700 WATT POWER SUPPLY



ASC-700C

- 135 mm TEMPERATURE-CONTROLLED SILENT FAN
- INTEL ATX 12V 2.2 SPECIFICATION
- BUILT-IN 6 SETS OF SATA CONNECTORS
- PCI EXPRESS READY
- RoHS COMPLIANT
- SAFETY: (OPP) (OVP) (SCP) (OCP) PROTECTION

Master Distributor



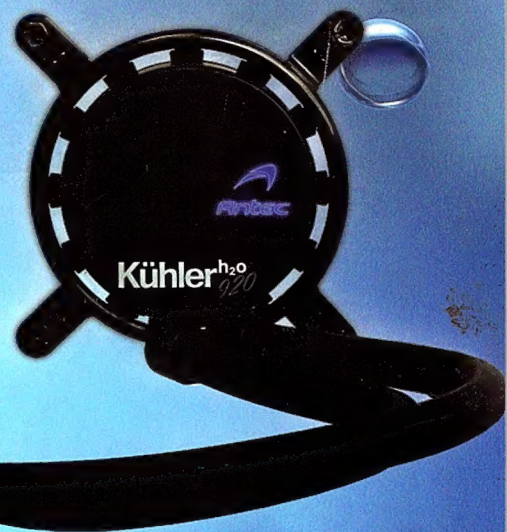
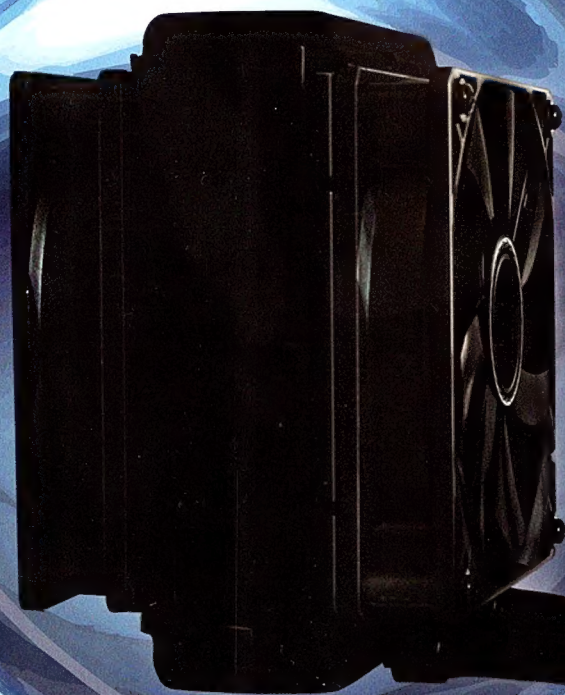
Australia I.T. Pty Ltd (Melbourne)
Address: Unit 2, 35 Dunlop Road Mulgrave, VIC 3170
Tel : +61 3 9560 3188
Fax : +61 3 9560 3166
Web: www.australiait.com.au

Australia I.T. Pty Ltd (Sydney)
Address: Unit 22, 4A Bachell Avenue Lidcombe, NSW 2141
Tel : +61 2 9643 1388
Fax : +61 2 9643 1488
Web: www.australiait.com.au

Antec 25

A Quarter Century of Quality and Innovation

High Performance, Quiet, Easy to Install



Kühler^{h2O} 920

CPU Liquid Cooling System

3rd Generation
Copper Coldplate

Pulse Width Modulation (PWM)
Controlled Fans and
Chill Control Software

Low Profile Pump,
Zero Maintenance



NSW

ARC Computers	02 9748 8322	arc.com.au
Aus PC Market	02 9646 8000	auspcmarket.com.au
D & D Computer Technology	02 9742 3282	ddcomputer.com.au
UK International	02 9745 0877	uk.com.au
Techbuy	02 9648 1818	techbuy.com.au
TX Computer Solutions	02 96480055	txcomputer.com.au
WA		
Austin Computers	08 9201 2788	austin.net.au
Netplus Micro Computers	08 9242 7288	netplus.com.au
PLE Computers	08 9309 4771	ple.com.au

QLD

Computer Alliance	07 3420 3200	computeralliance.com.au
Game Dude	07 3387 1500	gamedude.com.au
Pc GoGo	07 32637988	pogogo.com.au
The Tech Shop	07 5596 3022	techshop.com.au
Umart Online	07 3369 3928	umart.com.au
SA		
Allneeds Computers	08 8211 8661	allneeds.com.au
Getright Computers	08 8231 0622	getright.com.au
Phototech Computers	08 8349 4334	phototech.com.au
MATS Systems	08 8186 2110	mats-systems.com.au

VIC

CentreCom	1300 007 600	centrecom.com.au
Computers & Parts Land	03 8542 8688	cpl.net.au
PC Case Gear	03 9551 0889	pccasegear.com
Scorpion Technology	1300 726 770	scorptec.com.au
ACT		
Principal Computers	02 6223 2477	principalcomputers.com.au
TAS		
Principal Computers	03 6235 5010	principalcomputers.com.au
Taspro Computers	03 6424 1911	taspro.com.au
NT		
Palmerston Computers	08 89325 366	palmerstoncomputers.com.au

AUCKLAND

Computer Lounge	09 368 4818	computerlounge.co.nz
DTC	09 623 4988	dtonline.co.nz
Extreme PC	09 849 4888	extremepc.co.nz
Playtech	09 415 1020	playtech.co.nz
XP Computers	09 529 9196	xpccomputers.co.nz
WELLINGTON		
Ascent Technology	04 802 3898	ascent.co.nz
Xtreme Systems	04-5660389	xtremesystem.co.nz
HAMILTON		
PB Technologies	07 839 6518	pbtchznz.co.nz